REPORT NUMBER: 214D-MGA-2009-003

SAFETY COMPLIANCE TESTING FOR FMVSS 214
SIDE IMPACT PROTECTION

GM HOLDEN LTD.
2009 PONTIAC G8 SEDAN
NHTSA NUMBER: C90109

PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Date: March 24, 2009

Report Date: April 24, 2009

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-07-D-00062.

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Joe Fleck, Project Engineer

Date: 4/24/2009

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Date: 4/24/2009

FINAL REPORT ACCEPTED BY:

COTR, Side Impact

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Technical Report Documentation Page

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15. Supplementary Notes			

16. Abstract

A 48/24 km/h 90° Moving Deformable Barrier Compliance Test was conducted on the subject 2009 Pontiac G8 Sedan in accordance with the specification of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-08 Side Impact Protection for determination of FMVSS 214 Side Impact Protection. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on March 24, 2009. The impact velocity of the Moving Deformable Barrier (MDB) was 53.1 km/h and the ambient temperature at the struck side (drivers) of the vehicle was 21°C. The target vehicle's maximum post test static crush was 175 mm at level 3. The test vehicle's occupant performance is as follows:

	DRIVER	PASS.
Left Upper Rib (LUR) Accel., g	21.9	32.4
Left Lower Rib (LLR) Accel., g	24.6	31.6
Lower Spine (T_{12}) Accel., g	27.2	31.1
Thoracic Trauma Index (TTI)	26	32
Pelvis (PEV) Accel., g	35.6	31.8

The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words Compliance Testing FMVSS 214D Side Impact Protection Side Impact Dummy (SID)		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave, SE Washington, D.C. 20590	
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Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2009 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-07-D-00062. The purpose of this test was to evaluate side impact protection in a 2009 Pontiac G8 Sedan manufactured by GM Holden, Ltd.

TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC), Laboratory Test Procedure TP-214D-08, dated December 15, 2006 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA2. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2

SUMMARY OF FMVSS 214 TEST

A model year 2009 Pontiac G8 Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 53.1 km/h. The specified impact velocity range is from 52.1 to 53.8 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 2012.2 kg and the test weight of the MDB was 1361.5 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on March 24, 2009.

One (1) real-time motion picture camera and nine (9) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and Side Impact Dummies (SIDs) can be found in Appendix A. Two 50th percentile adult male SIDs were placed in the driver and left rear passenger designated seating positions according to instructions specified in the OVSC Laboratory Test Procedure dated December 15, 2006. Each SID was instrumented in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)

The test vehicle was instrumented with twenty (20) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self contained on-board DTS TDAS Pro Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 175 mm at level 3, 1050 mm rearward of the vertical impact point. The driver and passenger SIDs, Serial Nos. 036 and 037 respectively, were calibrated just prior to this test.

Appendix A contains the still photograph prints. Appendix B contains the response data traces. Appendix C contains the dummy calibration data. Appendix D contains the calibration information.

SECTION 2 (continued)

SUMMARY OF FMVSS 214 TEST

The occupant data is summarized below:

ATD position	TTI (G's)	Peak Pelvis (G's)
Driver	26	35.6
Passenger	32	31.8

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Information	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Airbag	Yes	Yes	No	
Curtain Airbag	Yes	Yes	Yes	Yes

TEST NOTES

There was no valid data collected for:

Left Rear Sill Y

Left Lower B-Post Y after 10 msec

The following accelerometers were not used for this test:

Rear Seat Track

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

TEST VEHICLE INFORMATION

Make	Pontiac
Model	G8
Body Style	Sedan
NHTSA No.	C90109
VIN	6G2ER57769L153688
Color	Stryker Blue Metallic
Delivery Date	3/6/09
Odometer Reading (mile)	130
Dealer	Libertyville Buick Pontiac GMC
Transmission	Automatic
Final Drive	Rear
Number of Cylinders	6
Engine Displacement (L)	3.6
Engine Placement	Longitudinal
Automatic Door Locks (ADL)	Yes
Owner's Manual Details Instructions on Disabling ADLs	No

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Airbag	Yes
Driver Curtain Airbag	Yes
Rear Passenger Side Airbag	No
Rear Passenger Curtain Airbag	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Anti-lock Brakes	Yes
Traction Control	Yes
All Wheel Drive	No
Power Seats	Yes
Pretensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	GM Holden, Ltd.
Date of Manufacture	03/08

GVWR (kg)	2280
GAWR Front (kg)	1020
GAWR Rear (kg)	1260

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	250	270
Recommended Tire Size	P245/45R18	P245/45R18
Tire Size on Vehicle	P245/45R18	P245/45R18
Tire Manufacturer	Goodyear	Goodyear

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				416
Cargo Wt. (RCLW) (kg)				76

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	456.9	452.9		500.3	555.2	
Right	kg	447.0	424.4		451.8	504.9	
Ratio	%	51.1	48.9		47.3	52.7	
Totals	kg	903.9	877.3	1781.2	952.1	1060.1	2012.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1781.2
Weight of 2 P572F ATDs	kg	161.4
Rated Cargo/Luggage Weight (RCLW)	kg	76
Calculated Vehicle Target Weight (TVTW)	kg	2018.6

* Actual As Tested Weight (ATW) will be TVTW -5/-10 kg

Weight of Ballast in trunk area: 49.9 kg

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	732	730	720	724	1437
As Tested	mm	719	729	688	695	1537
Fully Loaded	mm	715	728	682	693	

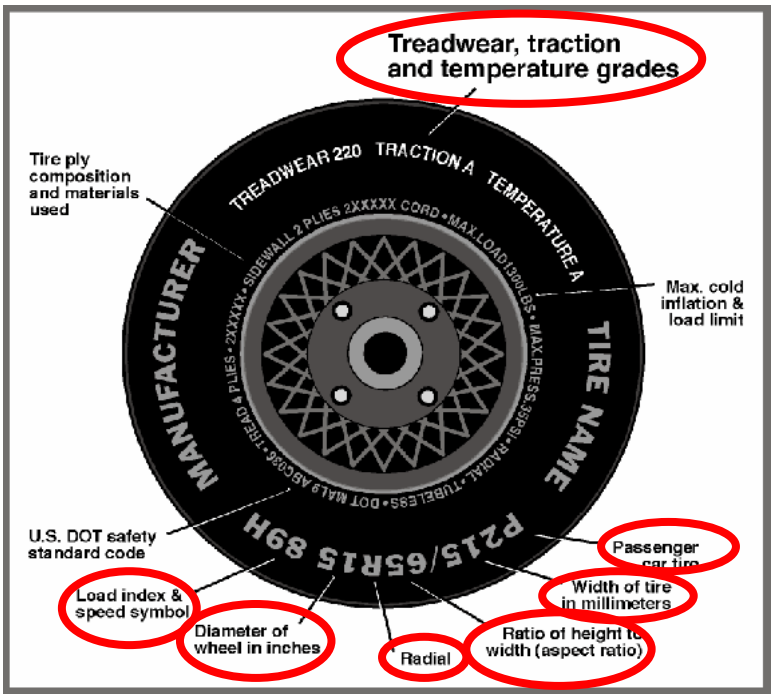
TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2917
Target Impact Point Aft of Front Axle	mm	508
Actual Impact Point Aft of Front Axle	mm	501

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	250	270
Recommended Tire Size	P245/45R18	P245/45R18
Tire Size on Vehicle	P245/45R18	P245/45R18
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle RS-A	Eagle RS-A
Tire Type	Passenger	Passenger
Tire Width (mm)	245	245
Ratio of Height to Width (aspect ratio)	45	45
Radial	R	R
Wheel Diameter	18	18
Load Index & Speed Symbol	96V	96V
Treadwear	260	260
Traction Grade	A	A
Temperature Grade	A	A

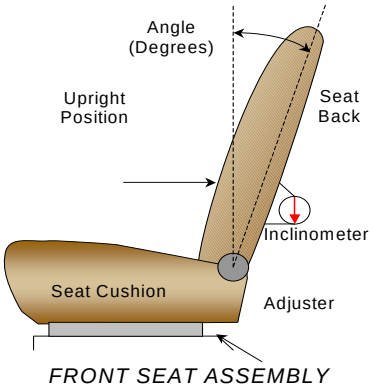
DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

NORMAL DESIGN RIDING POSITION

The driver seat back is positioned to the manufacturer's designated angle. The procedure is as follows: Seat back angle is determined by OSCAR torso angle of 24 degrees relative to the door sill.

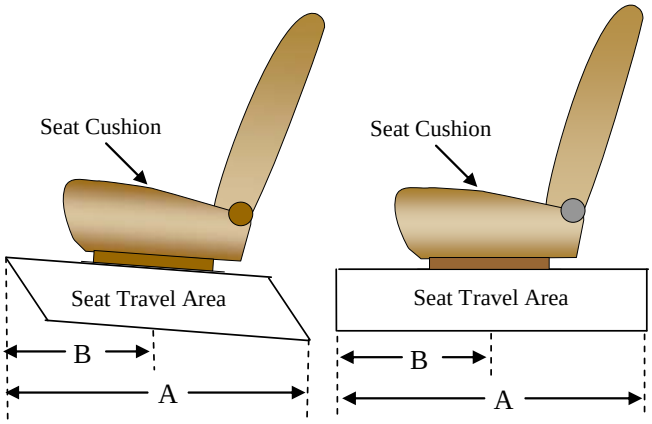


Driver seat back angle: 24.8 degrees (rear plastic cover, flush with the map pocket top edge)

Passenger seat back angle: Fixed

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	23 detents	11th detent (forward-most as 0)
Rear Seat	Fixed	Fixed



SEAT BELT UPPER ANCHORAGES

The D-ring anchorages were non adjustable.

DATA SHEET NO. 3 (CONTINUED)

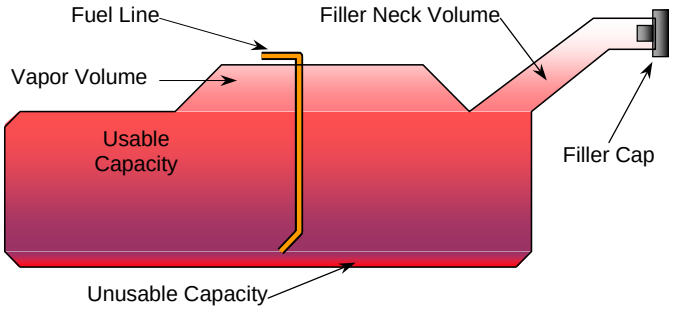
TEST VEHICLE INFORMATION

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	74.5
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	68.5 – 70.0
Actual Amount of Solvent used	69.6
1/3 of Usable Capacity	24.8

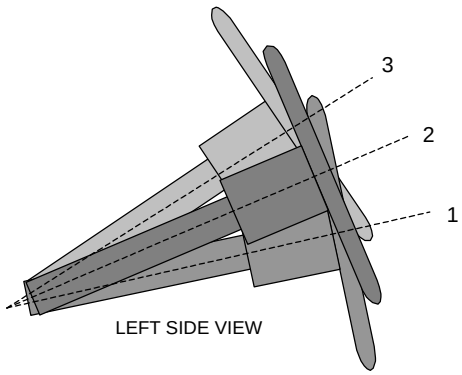
The test vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when the ignition is switched on. Fuel pump will shut down as soon as system is pressurized.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITION

	Fore/Aft (mm)	Degrees
Lowermost position No. 1	0	71.0
Geometric center position No. 2	20	69.2
Uppermost position No. 3	40	67.4

Pre-test measurements indicate the distance from the rear of the IP to the front edge of the steering wheel to be 98 mm.

DATA SHEET NO. 4

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2592
C.G. Location aft of Front Axle	1129

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	411.8	281.6	
Right	kg	356.8	311.3	
Ratio	%	56.5	43.5	
Totals	kg	768.6	592.9	1361.5

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	52.1 to 53.8	53.1
Trap No. 2 Velocity (Redundant)	km/h	52.1 to 53.8	53.4
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8

POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	7 forward
Vertical Offset	mm	+/-20	15 up

DATA SHEET NO. 5

POST TEST OBSERVATIONS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID	Rear Seat SID
Dummy Type / Serial No.	SID / 036	SID / 037
Head Contact	Curtain Airbag, Headrest, Headliner	Curtain Airbag, Headrest, Headliner
Upper Torso Contact	Side Airbag	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Doors were locked	Doors were locked
Left Side Door Opening	Door remained closed and latched	Door remained closed and latched
Right Side Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Movement	0	0
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Window Damage	Left Front and Left Rear Windows Broke
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Information	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Airbag	Yes	Yes	No	
Curtain Airbag	Yes	Yes	Yes	Yes

DATA SHEET NO. 6

SID INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

THORAX AND PELVIS PEAK ACCELERATIONS (FIR 100 FILTERED)

Location	Units	Driver				Left Rear Passenger			
		Positive	Time, ms	Negative	Time, ms	Positive	Time, ms	Negative	Time, ms
Upper Rib Y	G's	21.9	38.8	-10.6	12.6	32.4	55.7	-3.6	234.5
Upper Rib Yr	G's	22.1	38.8	-10.9	12.6	32.5	55.7	-3.5	105.7
Lower Rib Y	G's	24.6	37.0	-7.6	12.6	31.6	50.7	-5.9	105.1
Lower Rib Yr	G's	24.4	37.0	-8.1	12.0	32.1	50.7	-6.1	105.1
Lower Spine Y	G's	27.2	42.0	-3.1	85.7	31.1	55.7	-4.9	195.7
Lower Spine Yr	G's	27.1	42.0	-2.9	86.3	30.9	55.1	-5.1	195.7
Pelvis Y	G's	35.6	38.2	-3.0	62.0	31.8	45.1	-4.2	193.8
Pelvis Yr	G's	35.4	38.2	-2.9	61.9	31.7	45.1	-4.2	193.8

THORACIC TRAUMA INDEX (TTI) AND PELVIS ACCELERATION (FIR 100 FILTERED)

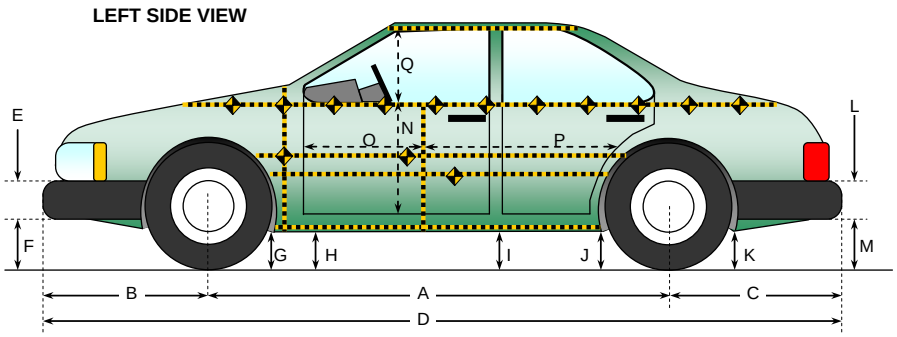
Location	Driver				Left Rear Passenger			
	LLR	T_{12}	TTI (g)	PEV (g)	LUR	T_{12}	TTI (g)	PEV (g)
Rib, Spine, and Pelvis	24.6	27.2	26	35.6	32.4	31.1	32	31.8
Rib, Spine, and Pelvis Redundant	24.4	27.1	26	35.4	32.5	30.9	32	31.7

Positive Acceleration Polarities: (Conforms to SAE J211)
Longitudinal (X) = Forward
Lateral (Y) = Right
Vertical (Z) = Down

DATA SHEET NO. 7

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



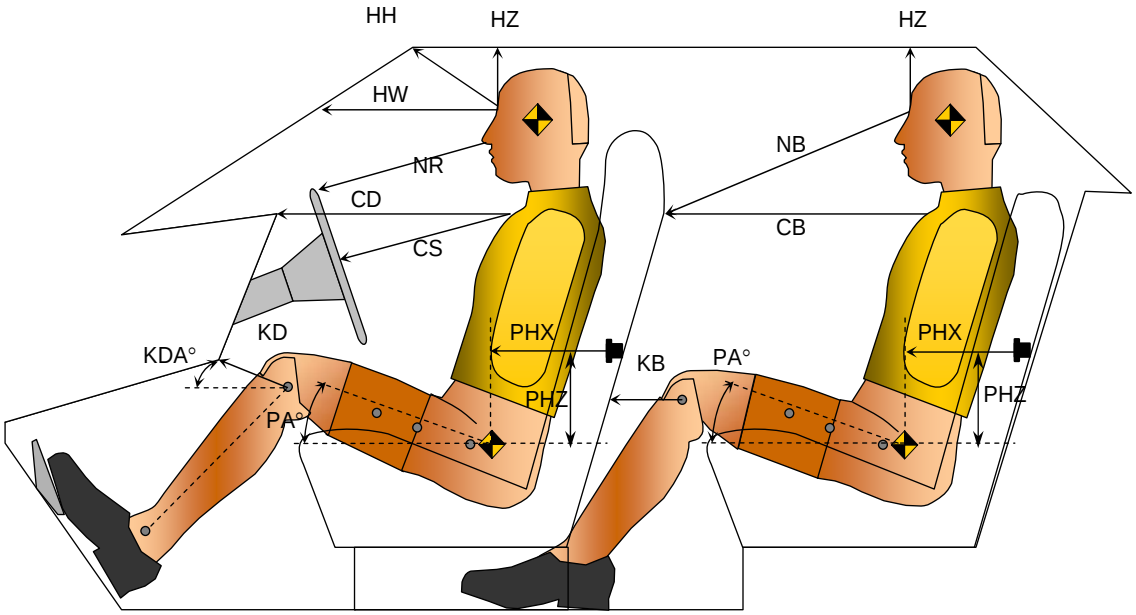
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2917	2907	-10
B	Front Axle to FSOV	885	885	0
C	Rear Axle to RSOV	1192	1188	-4
D	Total Length at Centerline	4994	4980	-14
E	Front Bumper Thickness	90	90	0
F	Front Bumper Bottom to Ground	217	241	24
G	Sill Height at Front Wheel Well	158	174	16
H	Sill Height at Front Door Leading Edge	162	173	11
I	Sill Height at "B" Pillar	152	135	-17
J1	Sill Height at Rear Wheel Well	141	137	-4
J2	Pinch Weld Height at Rear Wheel Well	142	136	-6
K	Sill Height Aft of Rear Wheel Well	195	188	-7
L	Rear Bumper Thickness	193	193	0
M	Rear Bumper Bottom to Ground	333	323	-10
N	Sill Height to Window Bottom Sill	682	610	-72
O	Front Door Leading Edge to Impact CL	692	692	0
P	Rear Door Trailing Edge to Impact CL	1286	1246	-40
Q	Front Window Opening	392	388	4
R	Right Side Length	3964	3967	3
S	Left Side Length	3964	3939	-25
T	Vehicle Width at "B" Post	1870	1771	-99

DATA SHEET NO. 8

SID LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

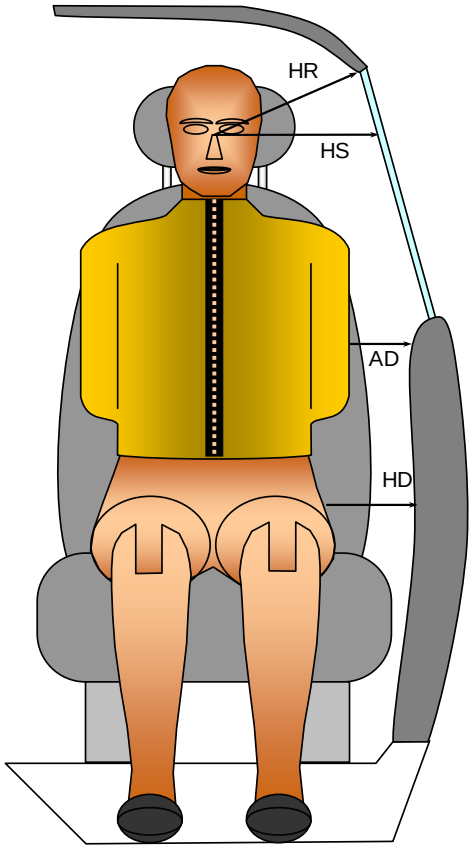


Driver Code	Pass. Code	Measurement Description	Driver S/N 036		Passenger S/N 037	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	348			
HW		Head to Windshield	622			
HZ	HZ	Head to Roof	160		144	
NR	NB	Nose to Rim/Nose to Seatback	442		646	
CD	CB	Chest to Dash or Seatback	543		586	
CS		Chest to Steering Wheel	365			
KDL	KBL	Left Knee to Dash or Seatback	230	22.3	226	16.9
KDR	KBR	Right Knee to Dash or Seatback	215	23.1	223	15.9
PA	PA	Pelvic Angle		23.4		23.9
PHX	PHX	H-Point to Striker (X-Axis)	195		250	
PHZ	PHZ	H-Point to Striker (Z-Axis)	140		317	

DATA SHEET NO. 9

SID LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



FRONT VIEW OF DUMMY

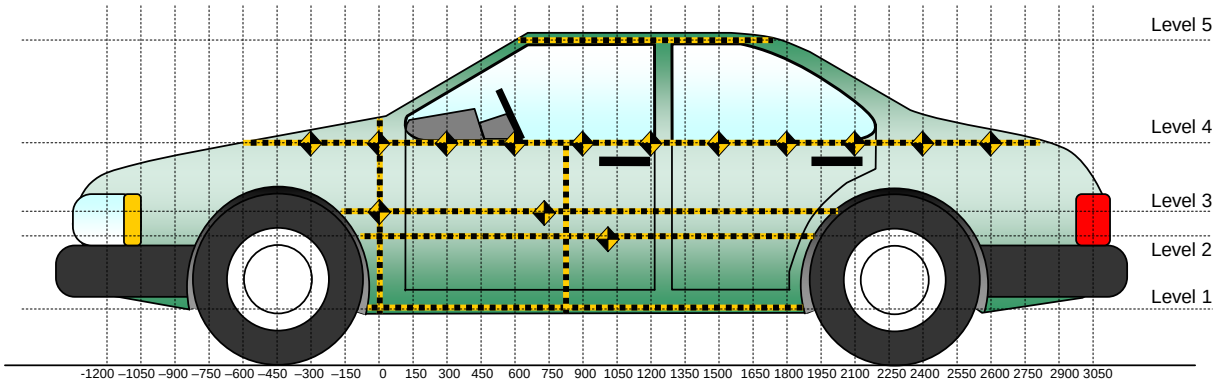
Code	Measurement Description	Units	Driver S/N 036	Passenger S/N 037
HR	Head to Side Header	mm	167	154
HS	Head to Side Window	mm	303	292
AD	Arm to Door	mm	120	80
HD	H-Point to Door	mm	152	165

DATA SHEET NO. 10

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2009 Pontiac G8 Sedan
Test Program: FMVSS 214

NHTSA No. C90109
Test Date: 3/24/2009



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
Measurements along the vertical 800 mm.
All measurements below in mm.

Level	Measurement Description	Maximum Exterior Static Crush	Distance From Impact	Height Above Ground
5	Window	32	1500	1365
4	Window Sill	112	1650	925
3	Mid Door	175	1050	630
2	Occupant H-Point	167	450	490
1	Sill Top	82	1200	300
	Maximum Penetration	175		

DATA SHEET NO. 11

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900				344					344					0	
-750				320					321					1	
-600				300					304					4	
-450				287					295					8	
-300				277					290					13	
-150			173	268				178	282				5	14	
0	208	184	178	260		248	266	227	275		40	82	99	15	
150	207	183	176	254		278	329	306	292		71	146	130	38	
300	203	180	173	251		261	340	302	283		58	160	129	32	
450	201	179	170	249		255	346	304	275		54	167	134	26	
600	198	178	168	244		264	340	302	276		71	162	134	32	
750	198	177	166	241		269	322	309	277		71	145	143	36	
900	197	177	166	238	497	273	331	323	277	512	76	154	157	39	15
1050	197	177	165	240	491	273	332	340	273	506	76	155	175	33	15
1200	196	178	165	240	488	278	313	310	270	508	82	135	145	30	20
1350	196	178	166	238	491	274	298	305	304	515	78	120	139	66	24
1500	198	178	167	240	492	258	311	323	332	524	60	133	156	92	32
1650	200	179	169	244	494	257	311	335	356	521	57	132	166	112	27
1800	204	180	172	246	497	260	303	319	335	515	56	123	147	89	18
1950	196	179	175	251	503	210	217	246	313	520	14	38	71	62	17
2100			165	254	517			183	296	536			18	42	19
2250				260	538				284	552				24	14
2400				269					294					25	
2550				280					299					19	
2700				291					306					15	
2850				306					317					11	
3000				326					329					3	

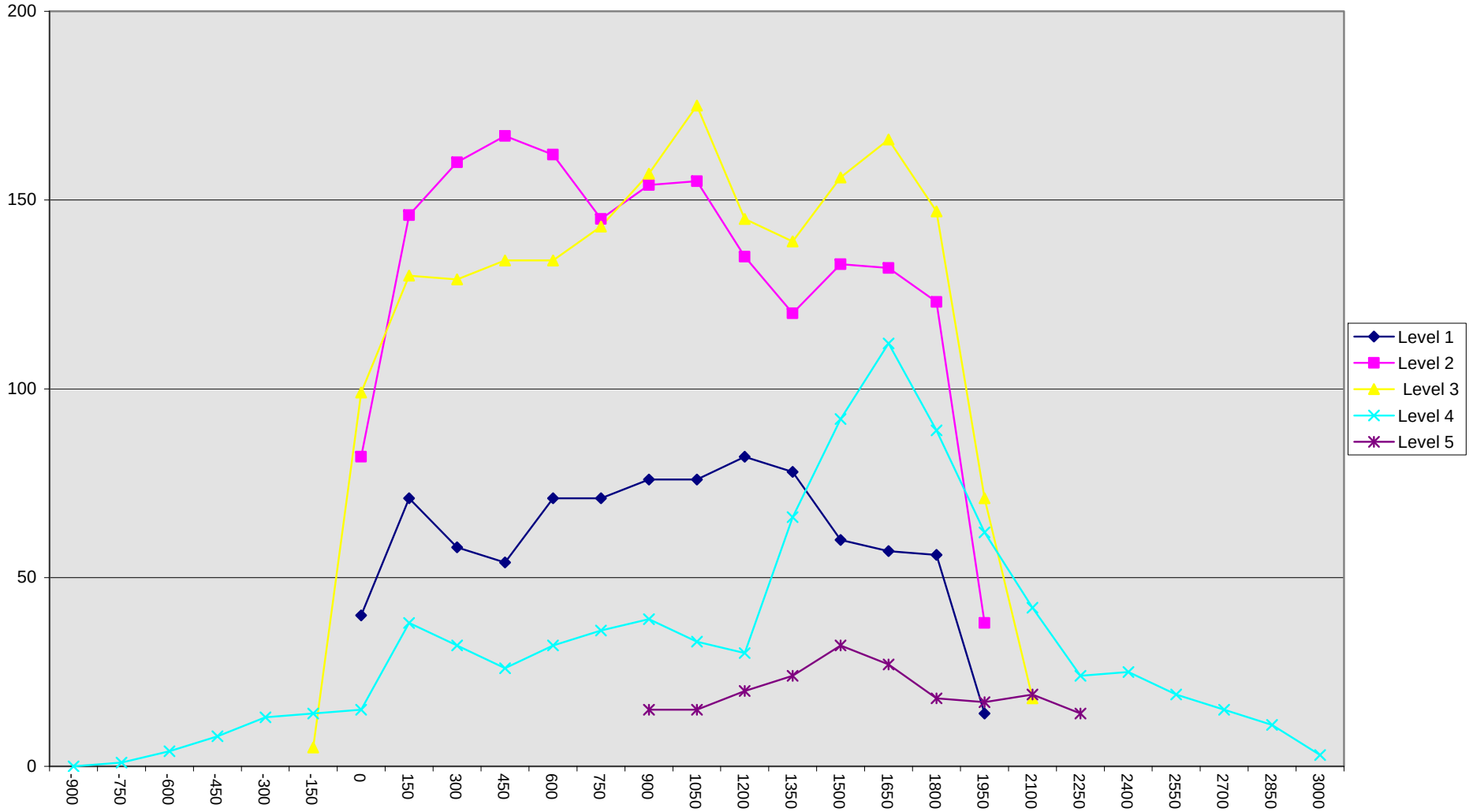
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

DATA SHEET NO. 11... (continued)

VEHICLE EXTERIOR CRUSH PROFILES

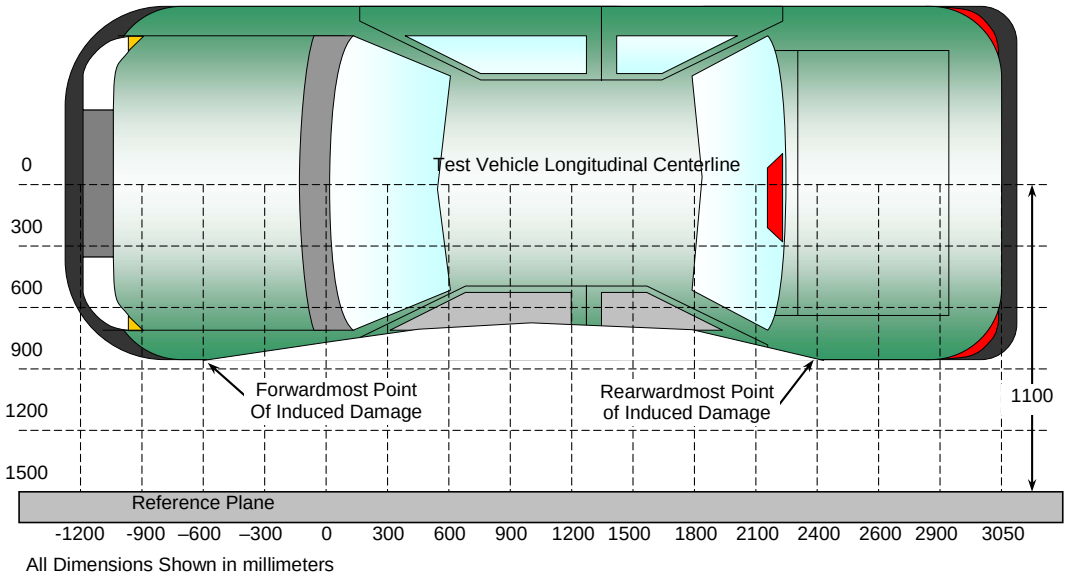
Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



DATA SHEET NO. 12

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



TOP VIEW

DAMAGE PROFILE DISTANCES

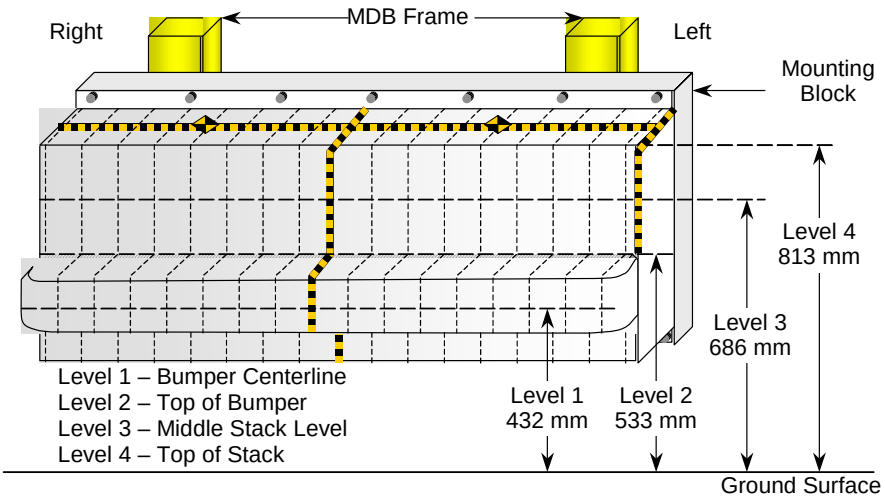
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	3000	4	326	329	3
2	2220	4	260	283	23
3	1430	3	203	329	126
4	655	1	198	343	145
5	-115	2	184	205	21
6	-900	4	344	344	0

Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body.

DATA SHEET NO. 13

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2009 Pontiac G8 Sedan
Test Program: FMVSS 214
NHTSA No. C90109
Test Date: 3/24/2009



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C_L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	184	197	183	183	197	177	159	143	132	129	126	124	130	129	140	159	153
2	132	138	141	137	106	119	96	85	86	87	88	90	89	88	89	90	98
3	35	27	32	40	64	63	39	23	19	20	22	26	32	41	57	84	108
4	13	6	16	38	79	73	38	33	33	34	38	45	51	61	77	98	116

All Dimensions in mm

DATA SHEET NO. 14

VEHICLE AND MDB ACCELEROMETER SENSOR DATA

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

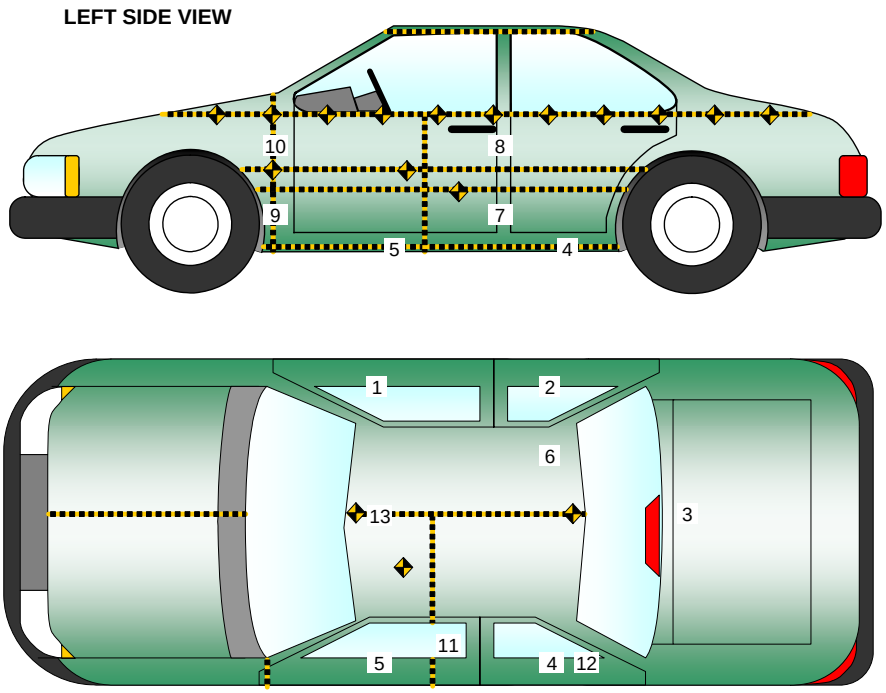
Description	Maximum Values (g's)			
	Positive	Time, ms	Negative	Time, ms
Right Front Sill X	3.4	53.5	-8.3	9.4
Right Front Sill Y	23.1	5.5	-2.7	107.4
Right Front Sill Z	7.1	8.2	-6.1	21.8
Right Front Sill Resultant	24.0	5.7		
Right Rear Sill X	2.3	54.1	-8.2	10.1
Right Rear Sill Y	24.9	5.4	-2.3	107.6
Right Rear Sill Z	7.0	16.3	-5.4	32.1
Right Rear Sill Resultant	25.4	5.3		
Floorpan @ Rear Axle X	1.3	5.4	-8.3	24.4
Floorpan @ Rear Axle Y	18.2	5.7	-1.8	107.2
Floorpan @ Rear Axle Z	10.5	28.8	-7.3	8.5
Floorpan @ Rear Axle Resultant	18.5	23.5		
Left Front Sill Y	38.5	2.6	-2.8	104.2
Left Rear Sill Y	(1)	(1)	(1)	(1)
Left Lower B-Post Y	(2)	(2)	(2)	(2)
Left Mid B-Post Y	90.9	2.3	-22.8	10.0
Left Lower A-Post Y	109.6	1.3	-13.7	26.5
Left Mid A-Post Y	69.0	0.8	-17.4	18.1
Vehicle CG X	2.7	16.4	-6.5	21.7
Vehicle CG Y	28.9	5.4	-2.1	102.9
Vehicle CG Z	9.5	14.7	-5.0	30.2
Vehicle CG Resultant	29.0	5.4		
Driver Seat Track Y	33.2	7.5	-8.4	13.0
RR Occupant Compartment Y	24.4	5.4	-2.3	107.2
MDB CG X	1.2	300.0	-19.3	66.1
MDB CG Y	0.6	91.8	-7.6	66.2
MDB CG Z	6.8	88.7	-7.2	77.1
MDB CG Resultant	21.0	65.6		
MDB Rear X	1.4	144.6	-24.4	67.3
MDB Rear Y	4.9	60.9	-4.0	87.5

(1) No valid data collected (2) No valid data collected after 10 msec

DATA SHEET NO. 15

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



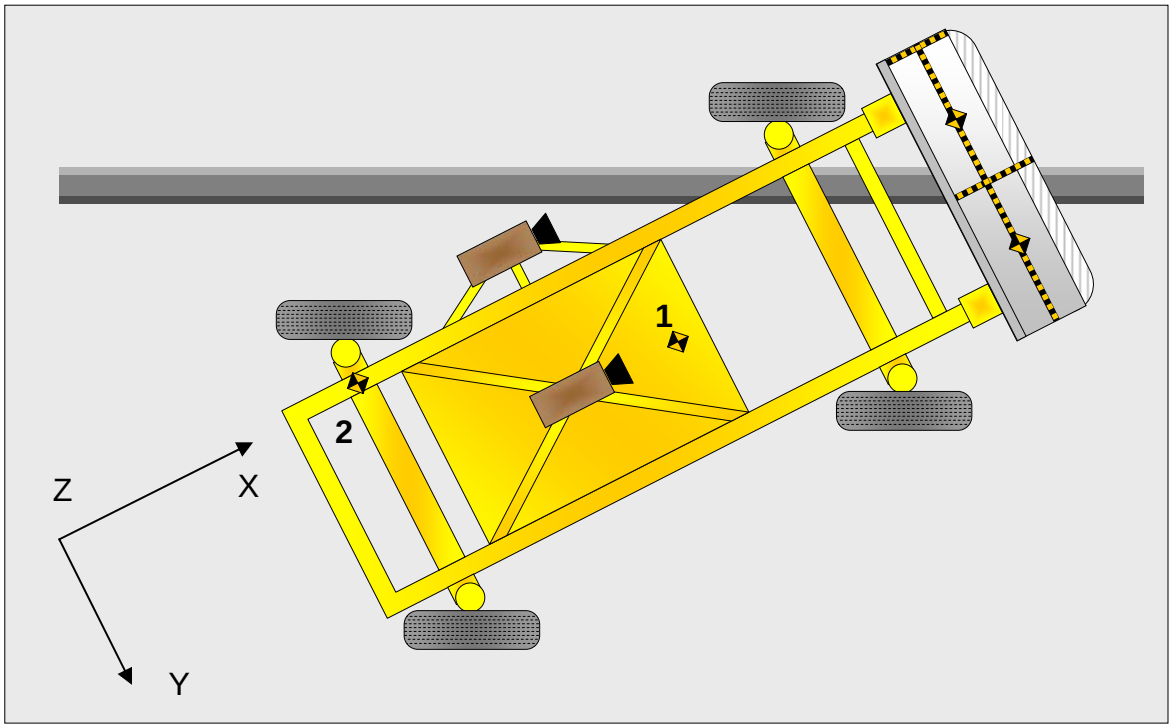
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2708	770	-206
2	Right Sill at Rear Seat	1588	770	-212
3	Rear Floorpan Above Axle	1022	0	-595
4	Left Sill at Rear Door	1622	-770	-205
5	Left Sill at Front Door	2686	-770	-201
6	Rear Occupant Compartment	1963	-368	-365
7	Left Lower B-Post	2396	758	-468
8	Left Middle B-Post	2902	-747	-775
9	Left Lower A-Post	3331	-731	-557
10	Left Middle A-Post	3321	-838	-735
11	Front Seat Track	2401	-545	-371
12	Rear Seat Track			
13	Vehicle CG	2754	0	-536

Reference Points X - Test Vehicle Rear Bumper (+ forward)
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 16

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



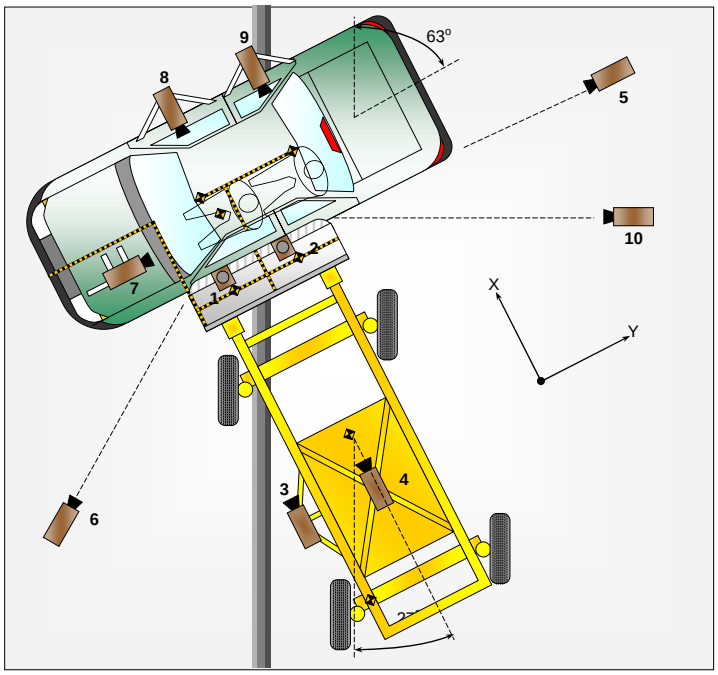
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	-1092	0	-483
2	MDB Rear	-2591	-625	-622

Reference Points
X - MDB Front Axle (+ forward)
Y - MDB Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 17

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	100	0	5050	50	1000
2	Overhead Overall	-375	0	5050	14	1000
3	MDB Onboard, Impact Point Close-up				50	1000
4	MDB Onboard, Centerline of Impact				16	1000
5	Right Side, Ground Level, Overall	1055	4950	1150	24	1000
6	Left Side, Ground Level, Overall	1175	-5050	1225	24	1000
7	Vehicle Onboard Front SID, Front				12.5	1000
8	Vehicle Onboard Front SID, Side				8	1000
9	Vehicle Onboard Rear SID, Side				8	1000
10	Real Time Coverage				13	24

Reference Points X - Impact Line
Y - MDB Left Edge Impact Point
Z - Ground Plane

DATA SHEET NO. 18

SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2009 Pontiac G8 Sedan NHTSA No. C90109
Test Program: FMVSS 214 Test Date: 3/24/2009

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 11:45 am

Stoddard Solvent Spillage Measurements

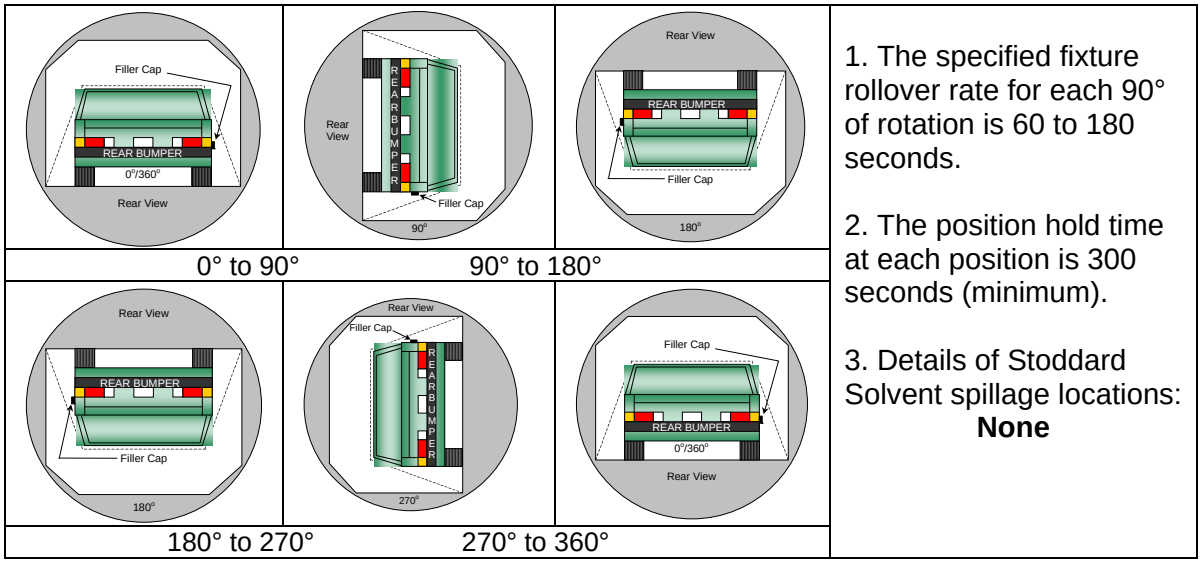
A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: None
(Maximum allowable = 5 ounces)

C. For the following 25 minutes: None
(Maximum allowable = 1 oz. /minute)

D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage locations: **None**

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage Collection Time (min)	Spillage (oz.)
0° to 90°	124	300	First 5	0
90° to 180°	121	300	First 5	0
180° to 270°	110	300	First 5	0
270° to 360°	117	300	First 5	0

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Left Front ¾ View, As Received

Right Rear ¾ View, As Received

A-3.

Manufacturer's Label

Tire Placard

Pre-Test Front View

Post-Test Front View

Pre-Test Left Front ¾ View

Post-Test Left Front ¾ View

Pre-Test Left Side View

Post-Test Left Side View

Pre-Test Left Rear ¾ View

Post-Test Left Rear ¾ View

Pre-Test Rear View

Post-Test Rear View

Pre-Test Right Rear ¾ View

Post-Test Right Rear ¾ View

Pre-Test Right Side View

Post-Test Right Side View

Pre-Test Right Front ¾ View

Post-Test Right Front ¾ View

Pre-Test MDB (left side) Positioned Against Vehicle

Pre-Test MDB (right side) Positioned Against Vehicle

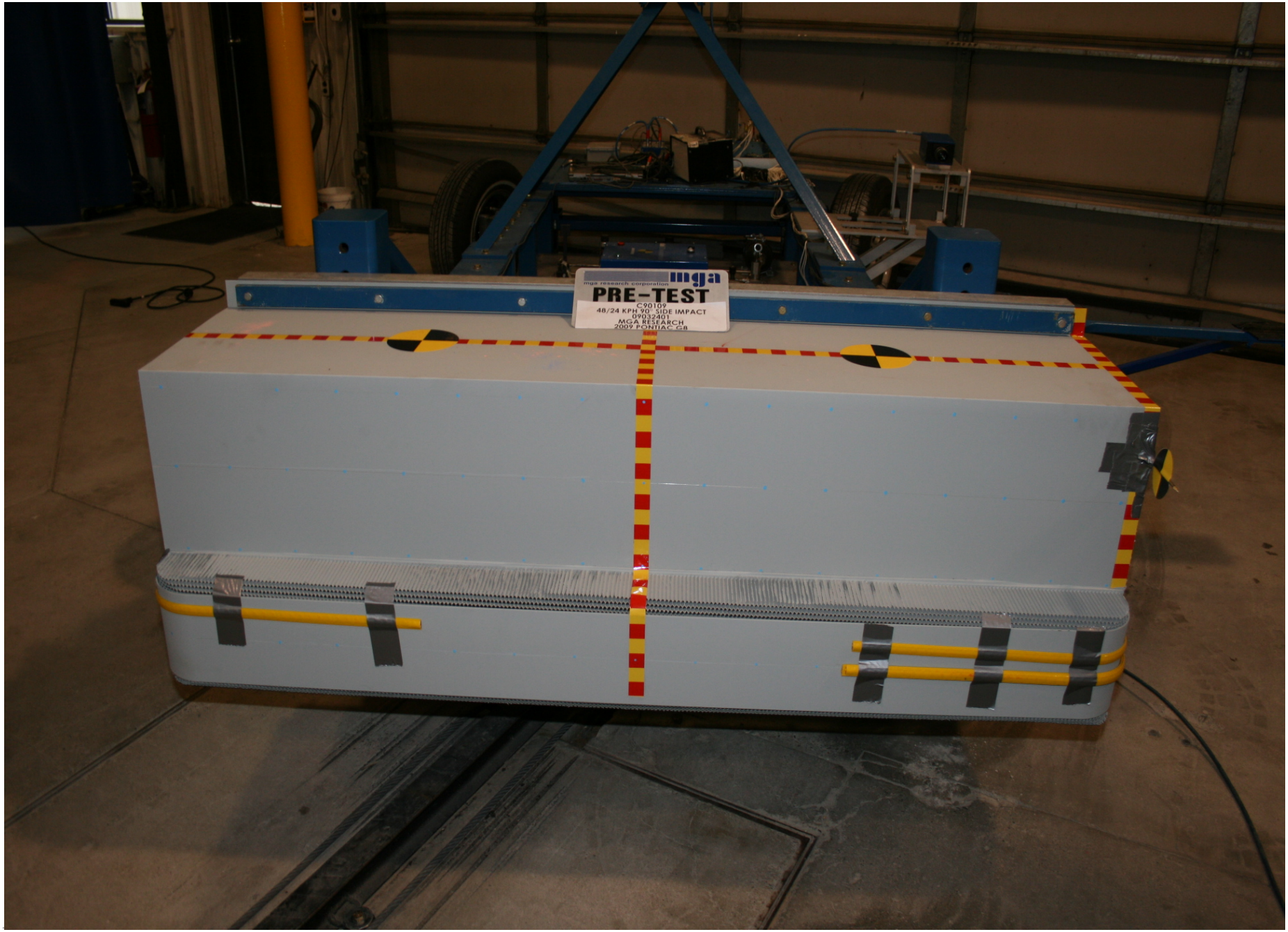
Pre-Test MDB Positioned Against Vehicle Overhead View

Post-Test MDB and Vehicle Overhead View

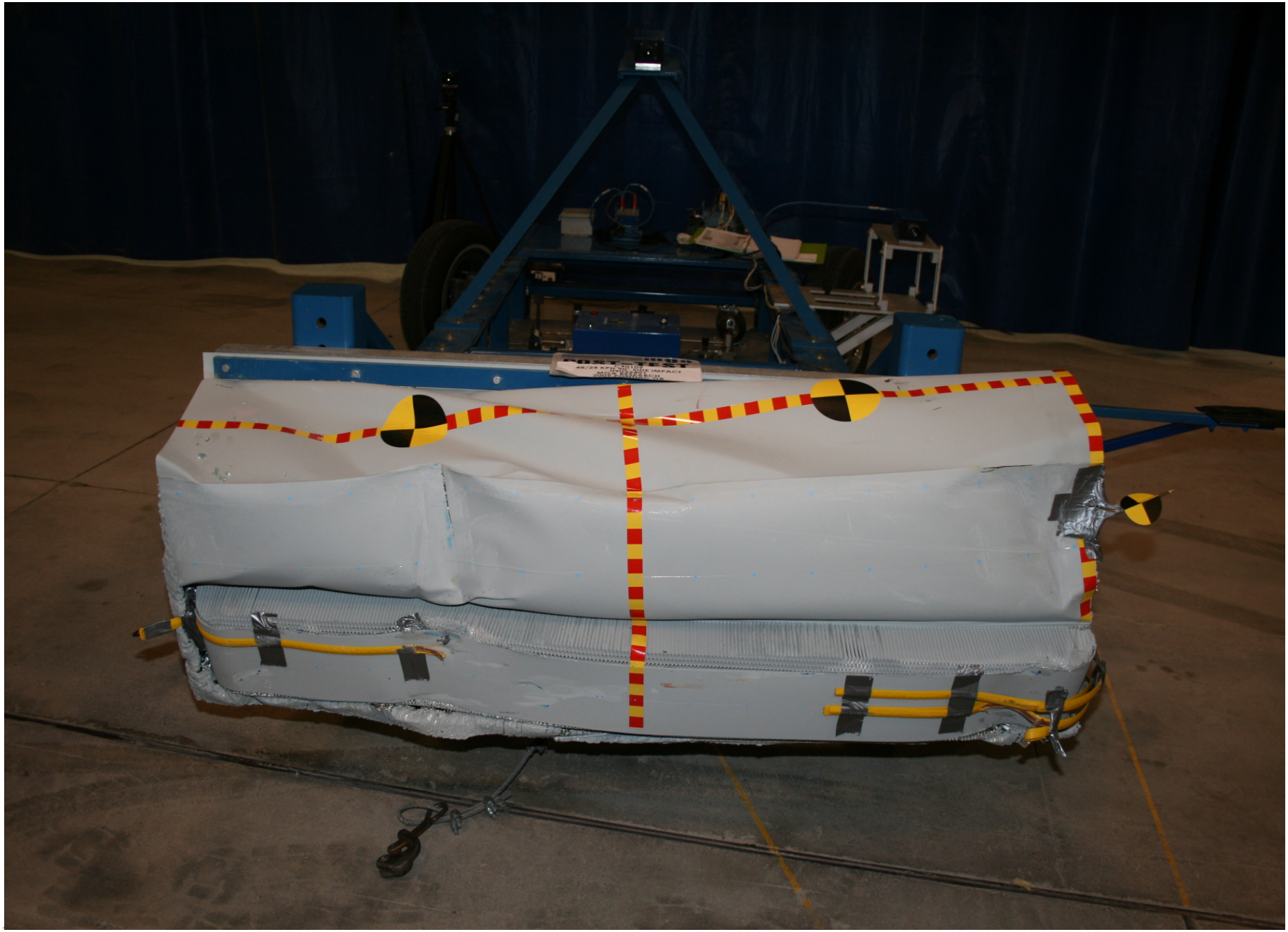
Post-Test Vehicle Overhead View

Pre-Test MDB Top View

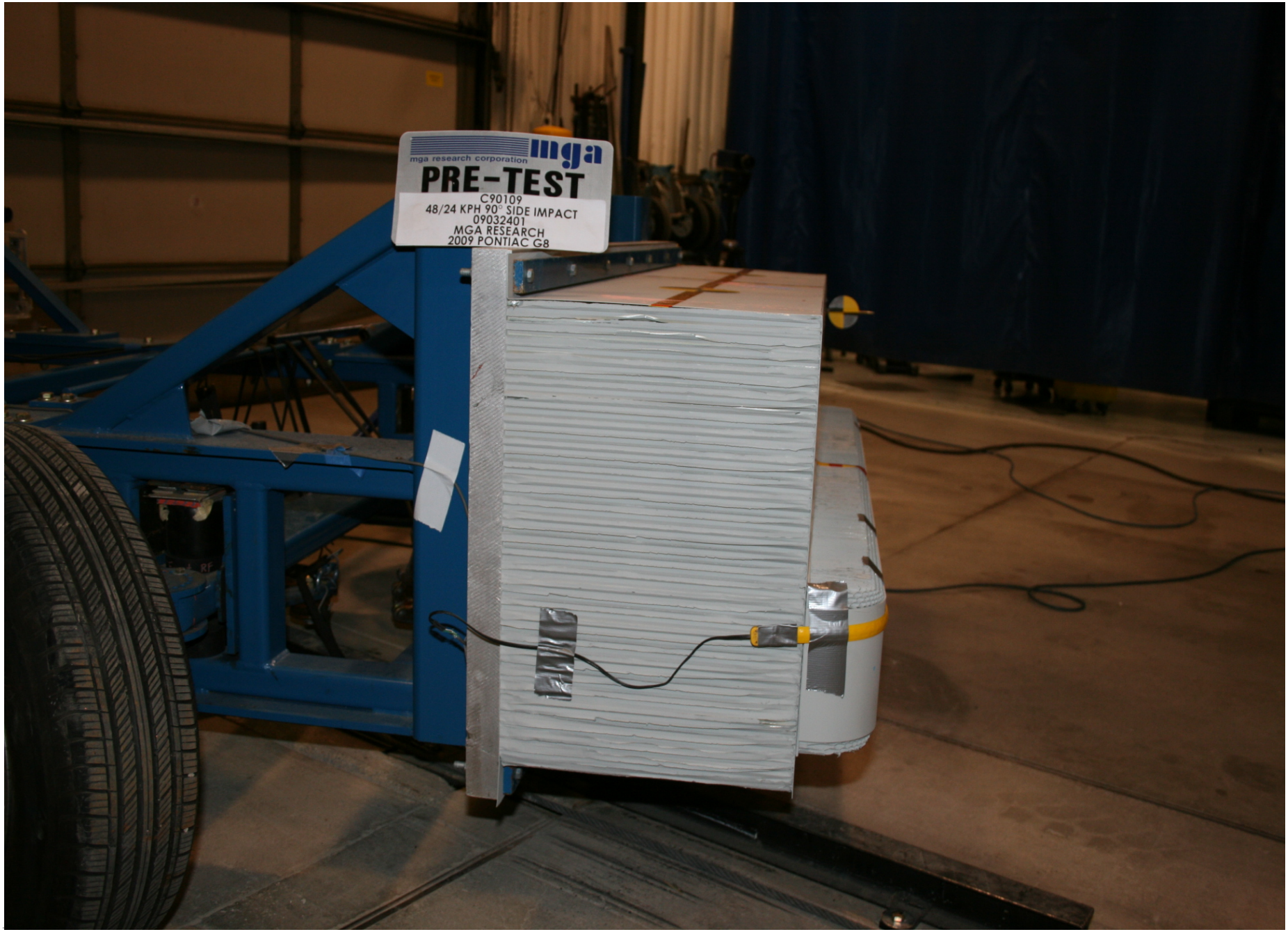
Post-Test MDB Top View



Pre-Test MDB Front View



Post-Test MDB Front View



Pre-Test MDB Right Side View

Post-Test MDB Right Side View

Pre-Test MDB Left Side View

Post-Test MDB Left Side View

Pre-Test Driver Dummy Right Side View

Post-Test Driver Dummy Right Side View

Pre-Test Driver Dummy Left Side View

Post-Test Driver Dummy Left Side View

Pre-Test Driver Dummy Left Side View (Door Open)

Pre-Test Driver Dummy Shoulder and Door Top View

Post-Test Driver Dummy Shoulder and Door Top View

Post-Test Driver Dummy Head Contact (CAB)

Post-Test Driver Dummy Head Contact (Headrest)

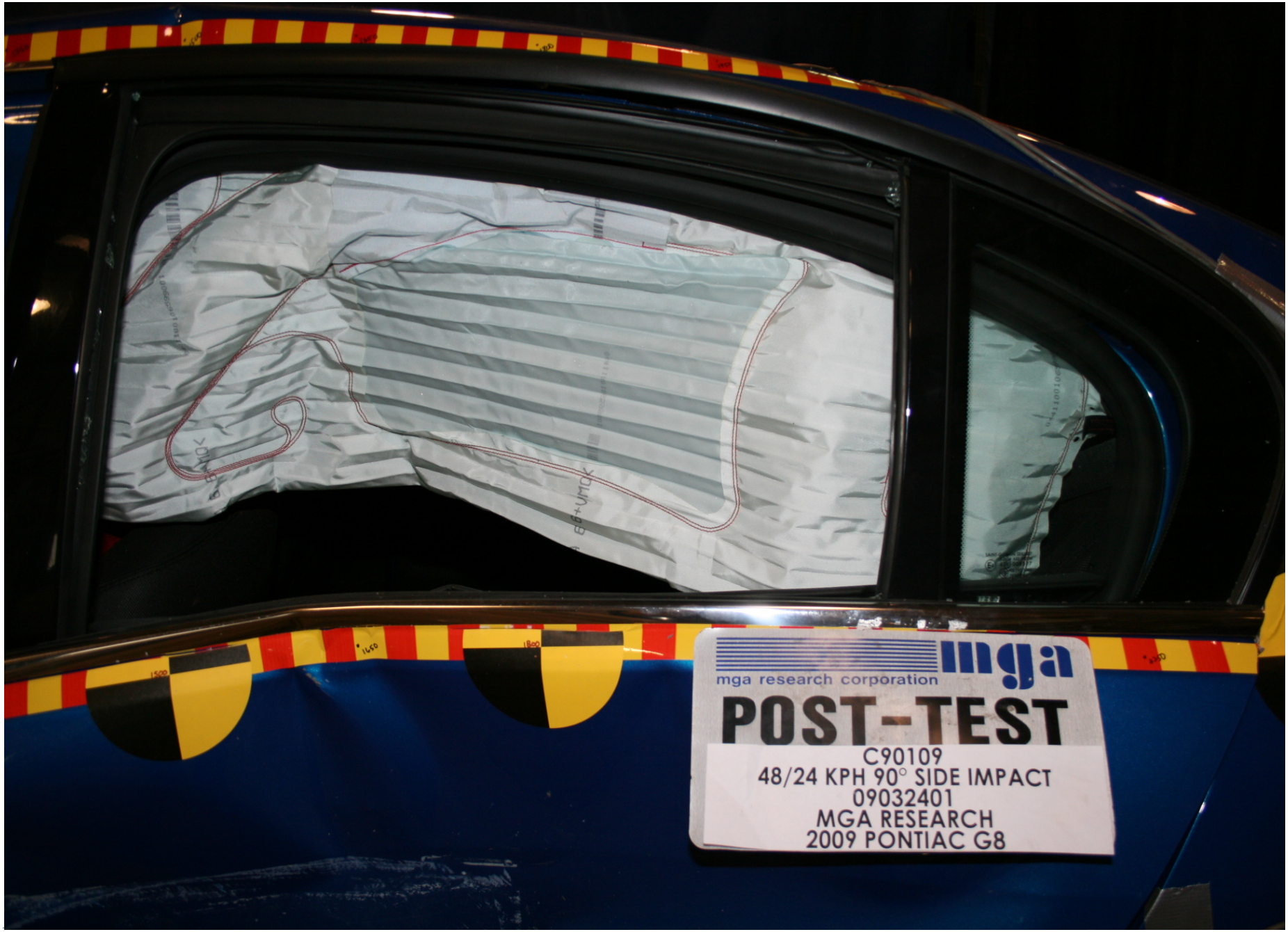
Post-Test Driver Dummy Mid Contact (SAB)

Post-Test Driver Dummy Lower Contact

Pre-Test Passenger Dummy Right Side View

Post-Test Passenger Dummy Right Side View

Pre-Test Passenger Dummy Left Side View

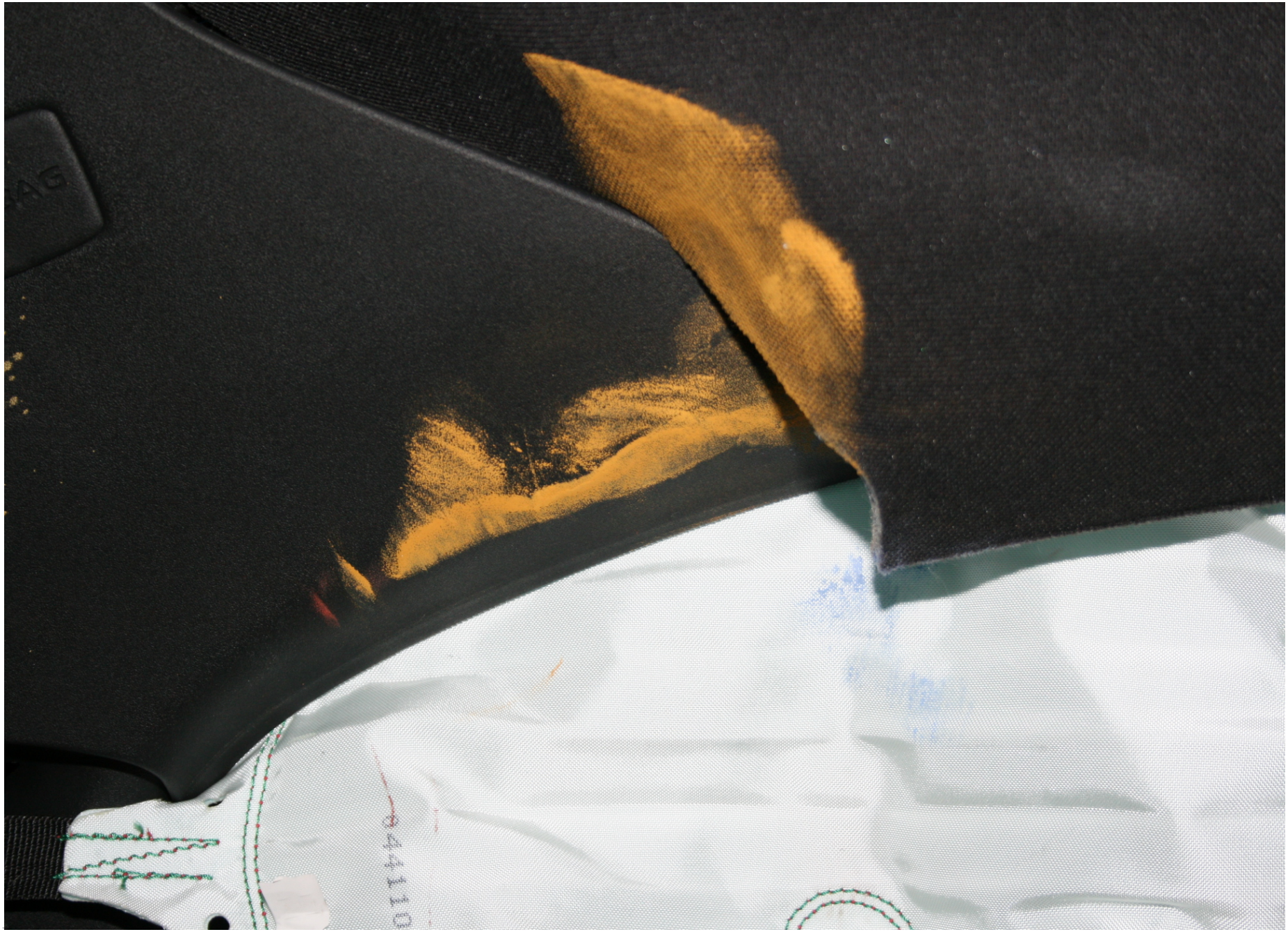


Post-Test Passenger Dummy Left Side View

Pre-Test Passenger Dummy Left Side View (Door Open)

Pre-Test Passenger Dummy Shoulder and Door Top View

Post-Test Passenger Dummy Shoulder and Door Top View



Post-Test Passenger Dummy Head Contact

Post-Test Passenger Dummy Head Contact (Headrest)

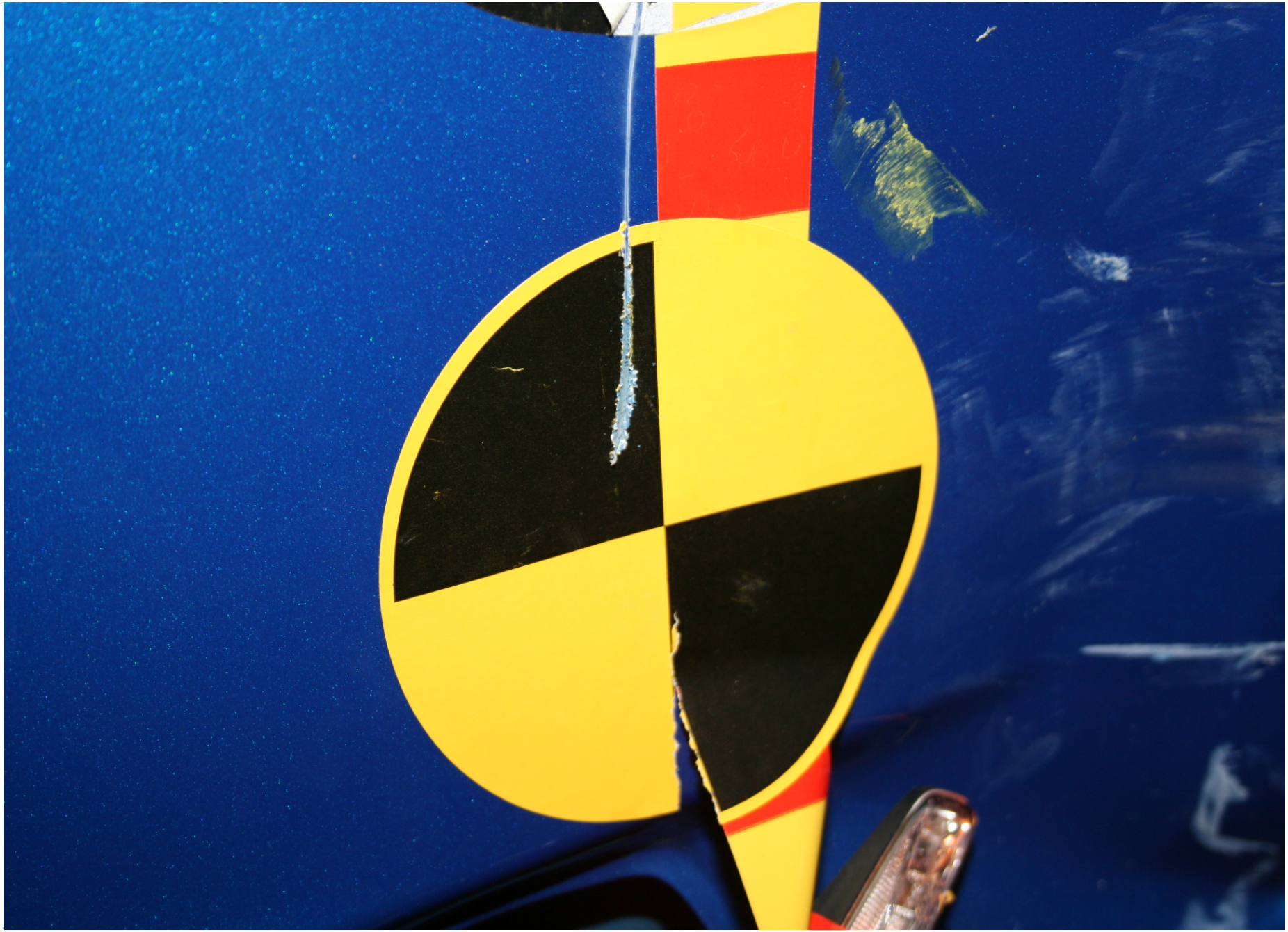
Post-Test Passenger Dummy Mid Contact

Post-Test Passenger Dummy Lower Contact

Pre-Test Fuel Filler Cap

Post-Test Fuel Filler Cap

Pre-Test Impact Point on Vehicle



Post-Test Impact Point on Vehicle

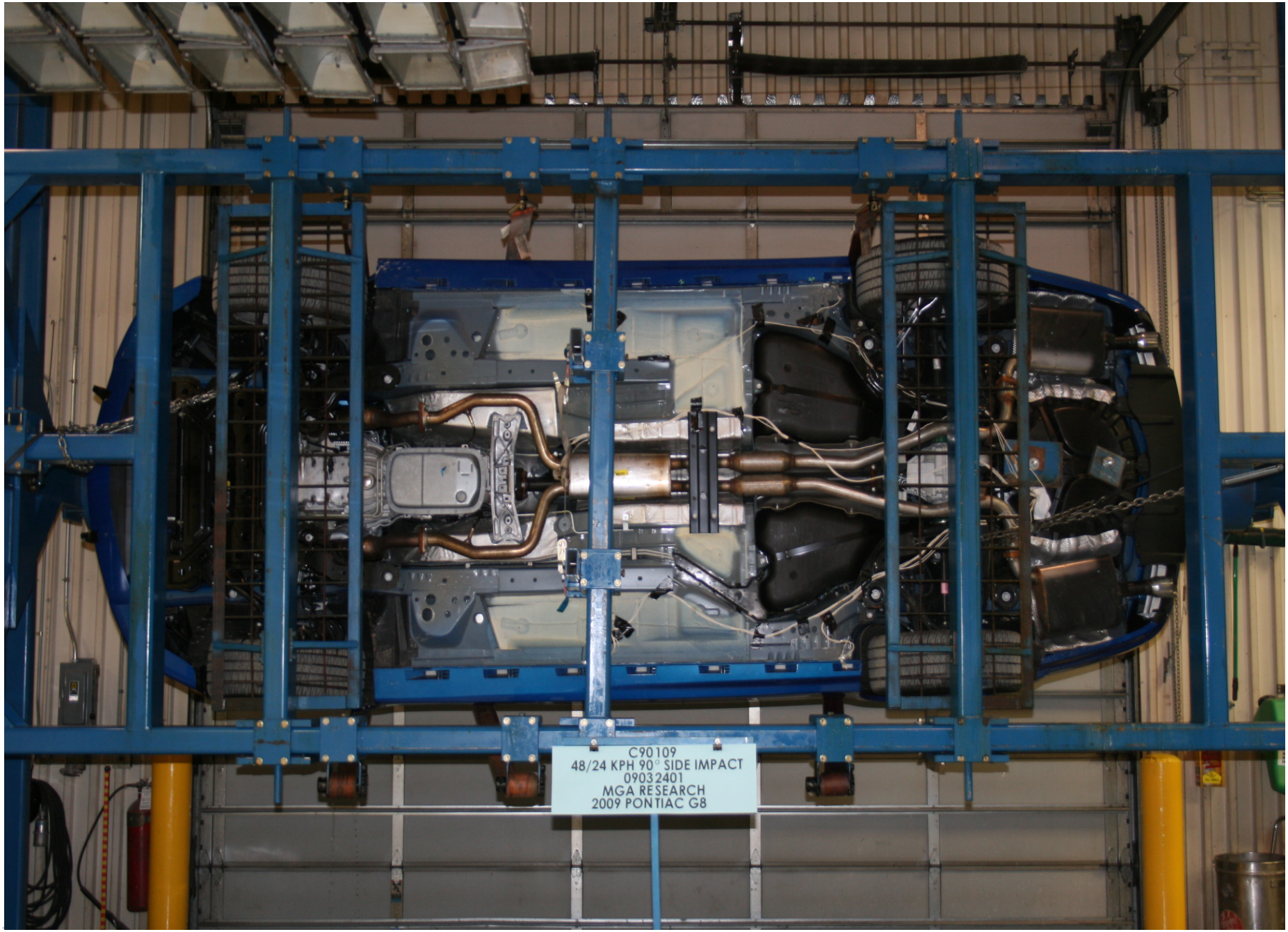
Pre-Test Overhead Close Up View

Post-Test Overhead Close Up View

Pre-Test Left Side Close Up View

Post-Test Left Side Close Up View

Impact



Rollover 90 Degrees

Rollover 180 Degrees

Rollover 270 Degrees

Rollover 360 Degrees

APPENDIX B

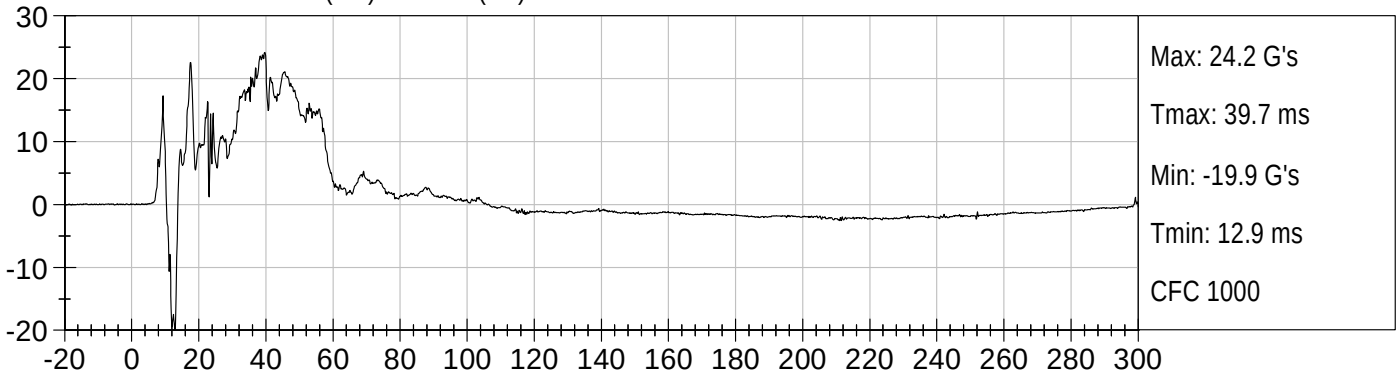
SID, VEHICLE, AND MDB RESPONSE DATA TRACES

TABLE OF DATA PLOTS

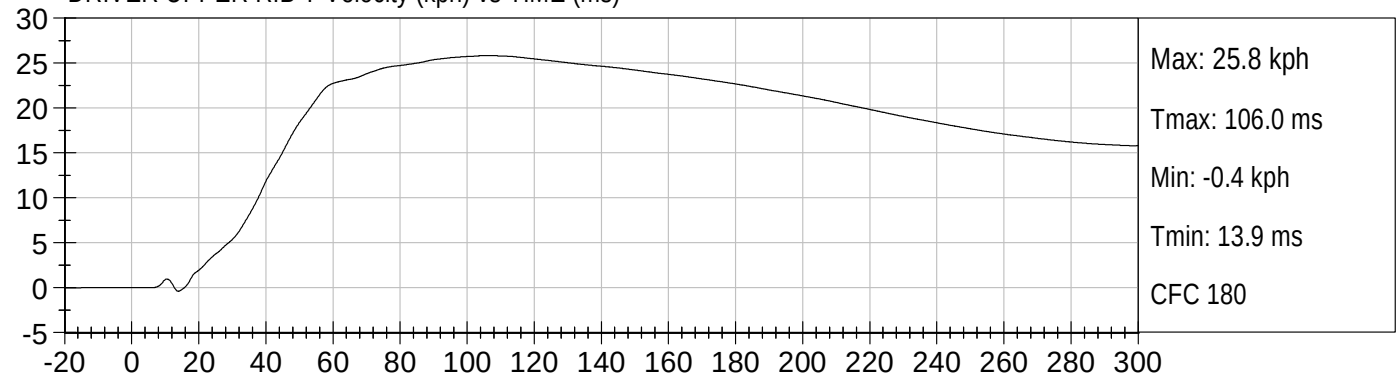
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

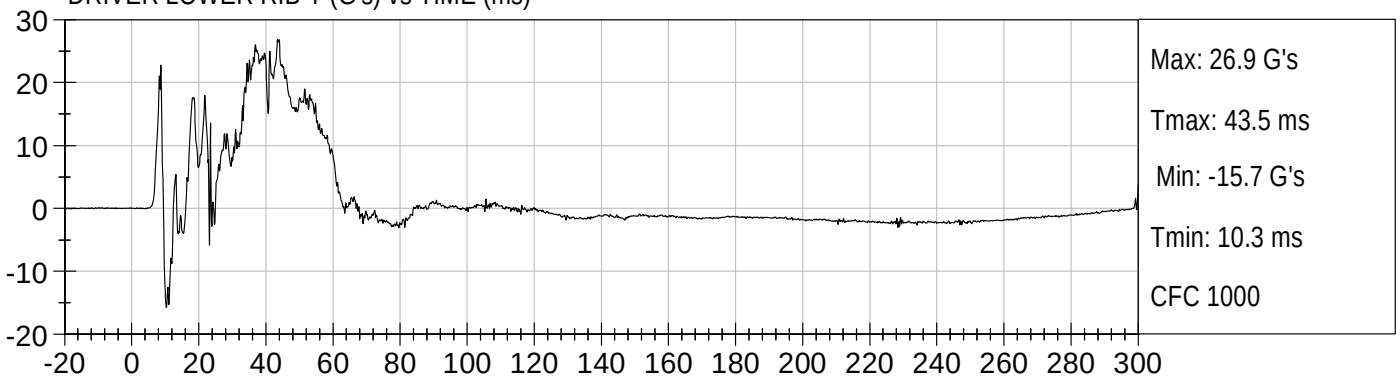
DRIVER UPPER RIB Y (G's) vs TIME (ms)



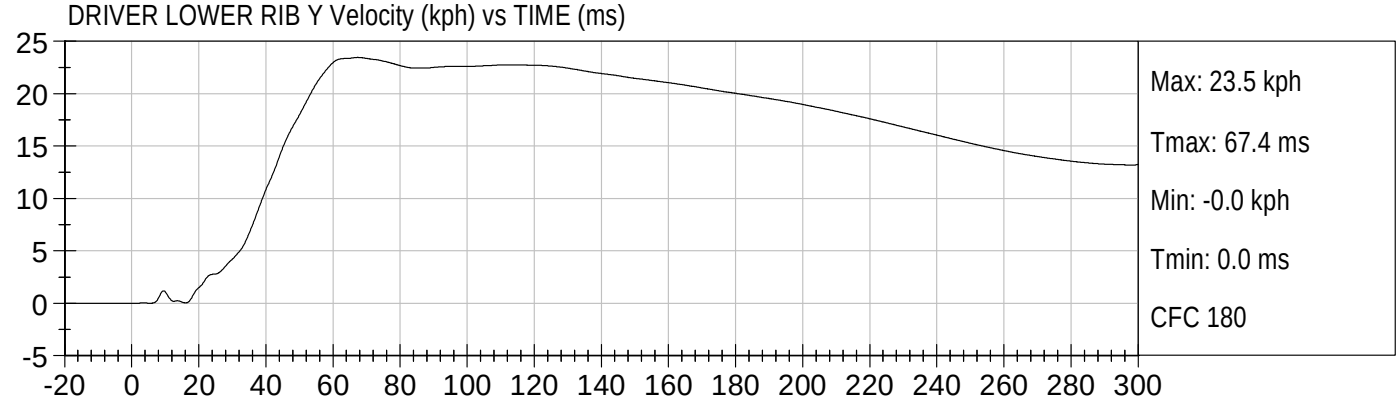
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)



DRIVER LOWER RIB Y (G's) vs TIME (ms)



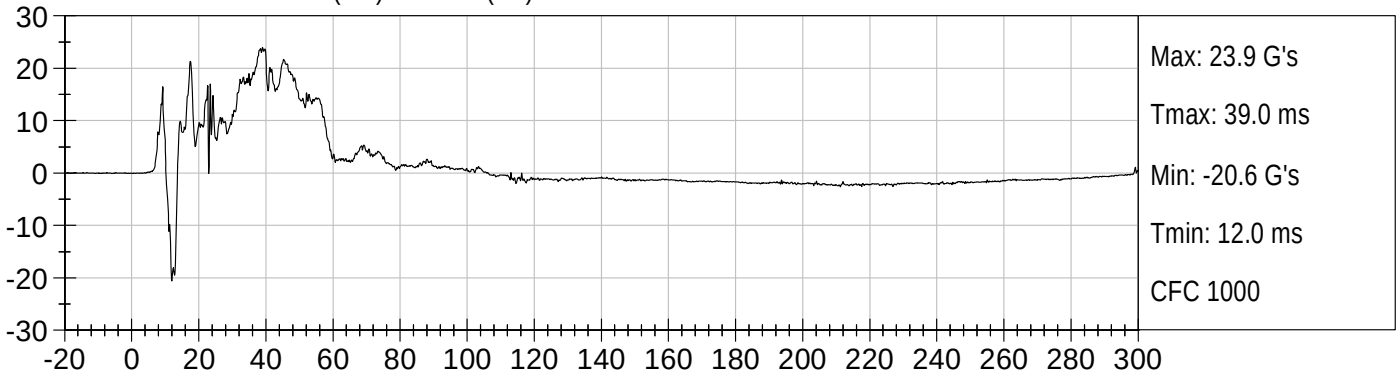
DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)



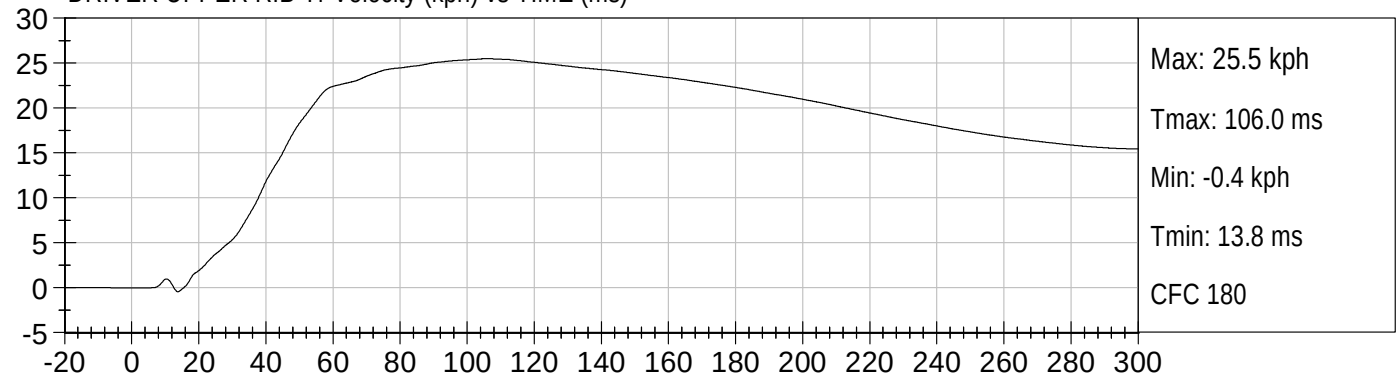
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

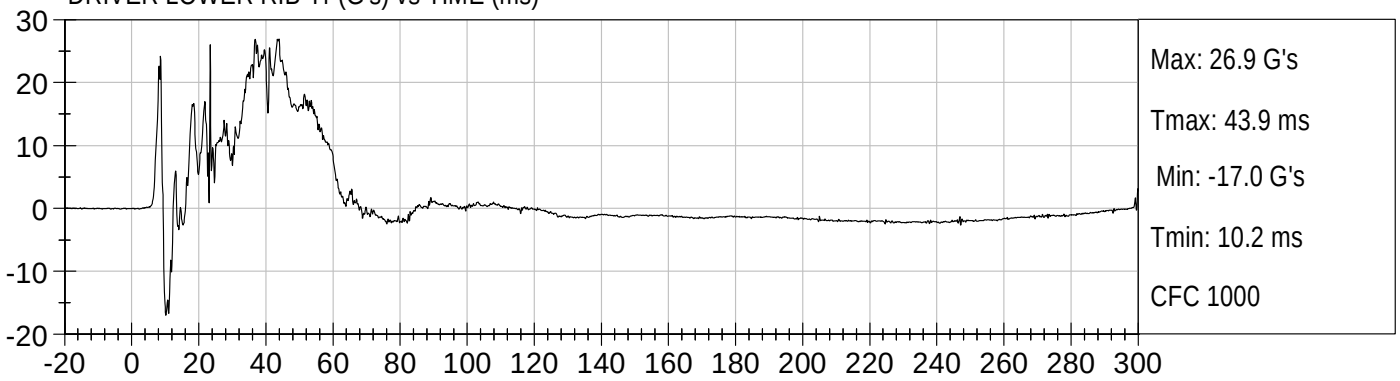
DRIVER UPPER RIB Yr (G's) vs TIME (ms)



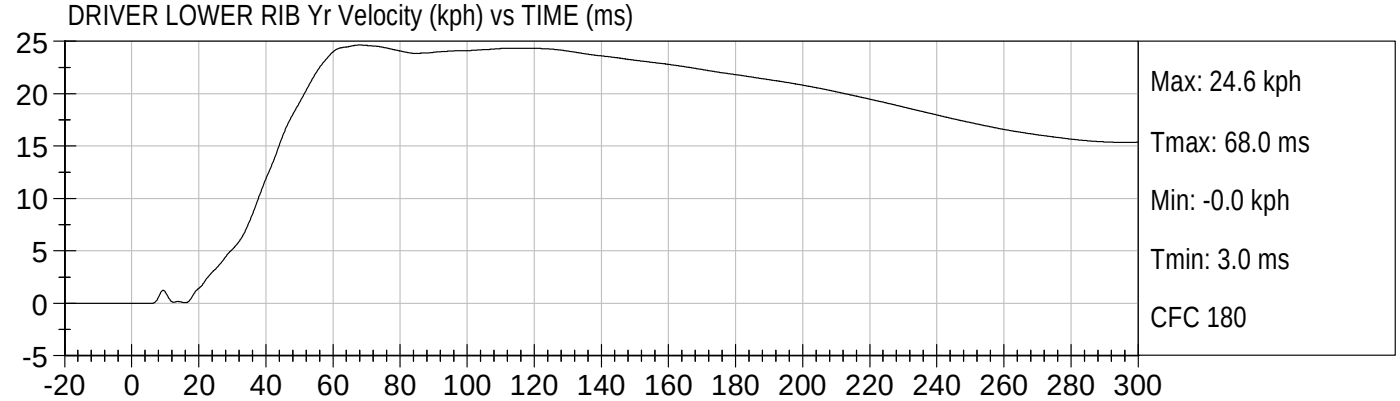
DRIVER UPPER RIB Yr Velocity (kph) vs TIME (ms)



DRIVER LOWER RIB Yr (G's) vs TIME (ms)



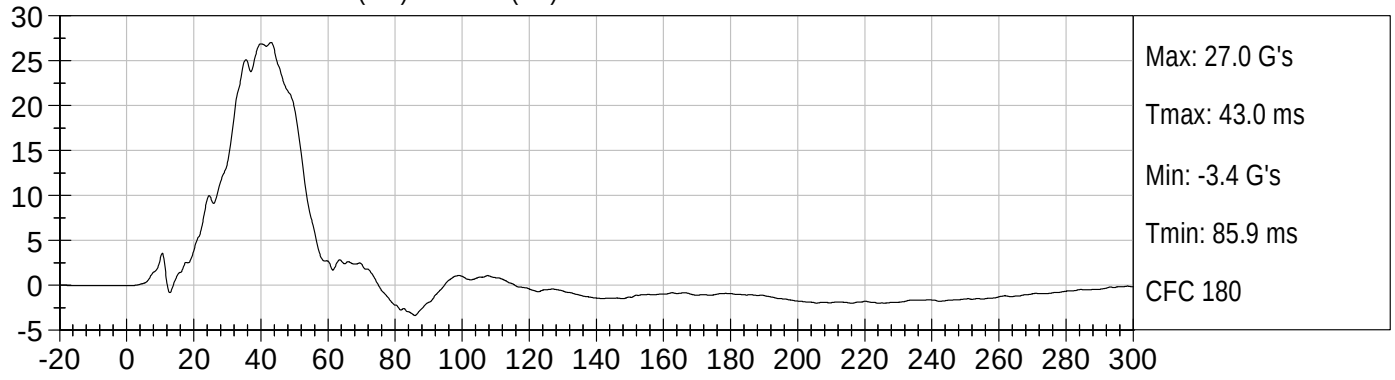
DRIVER LOWER RIB Yr Velocity (kph) vs TIME (ms)



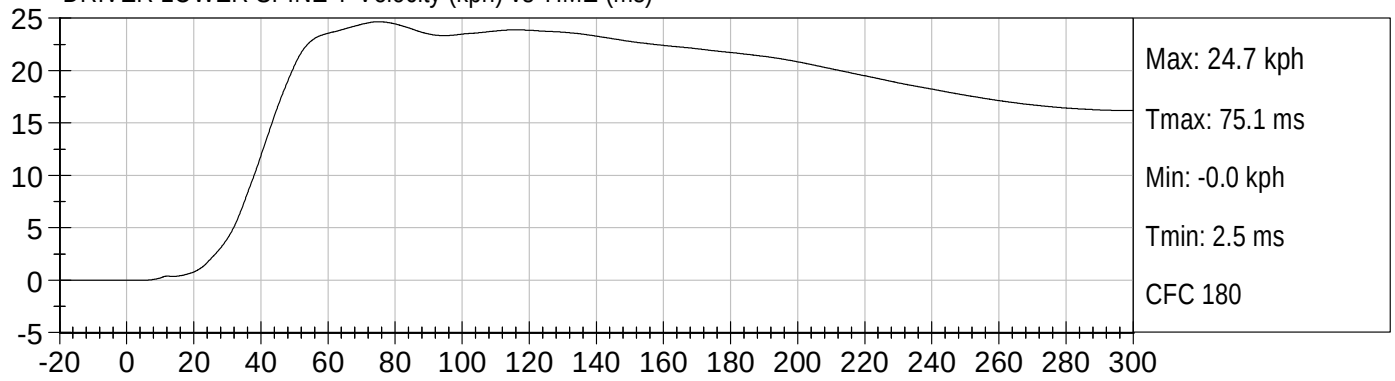
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

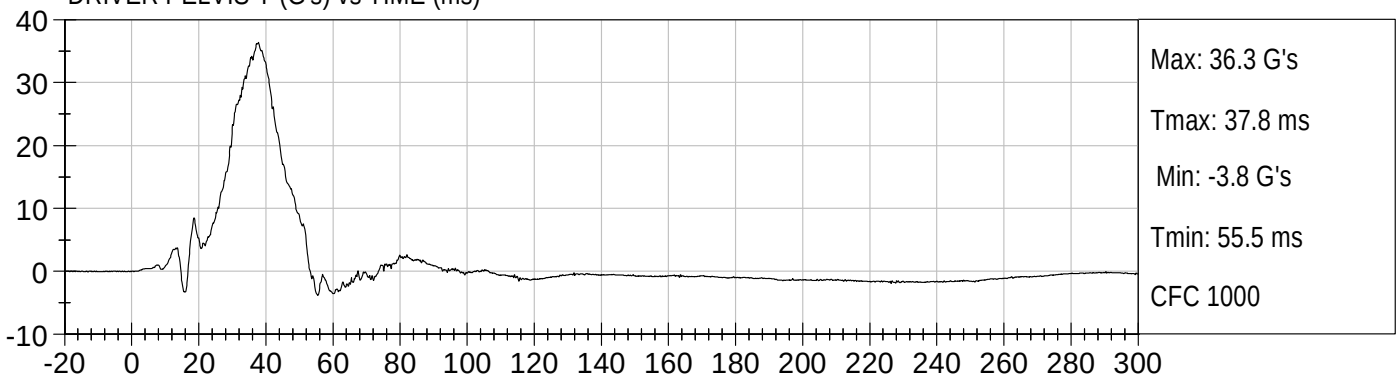
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



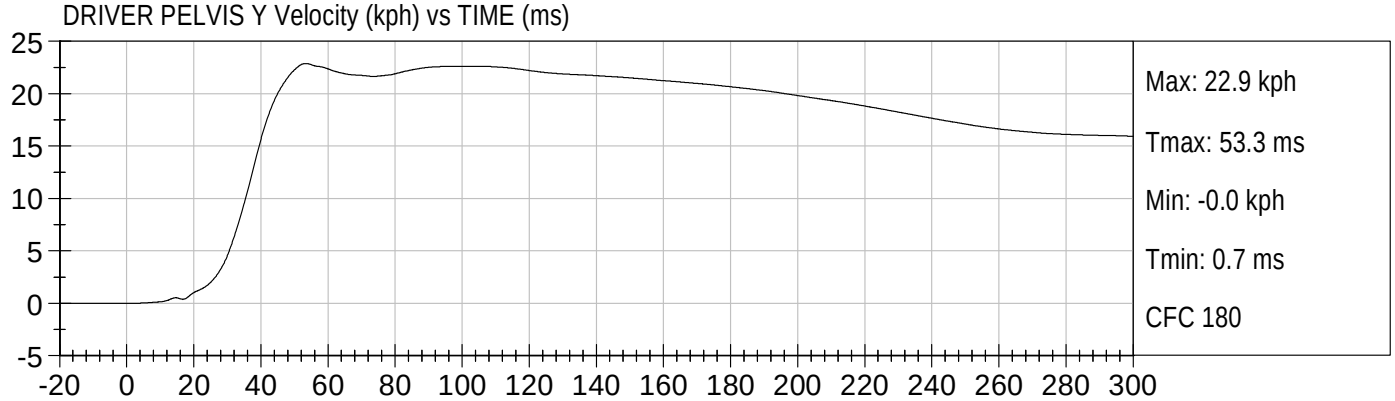
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)



DRIVER PELVIS Y (G's) vs TIME (ms)



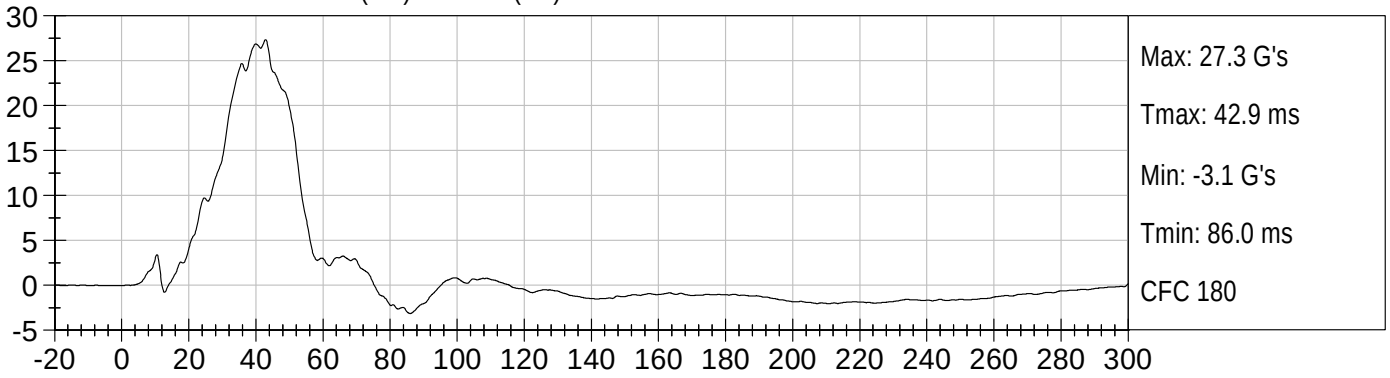
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)



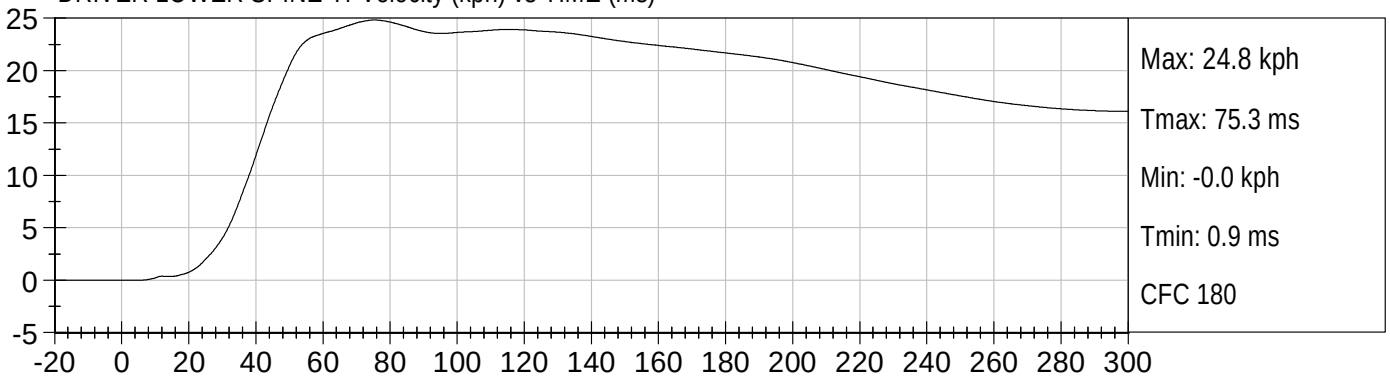
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

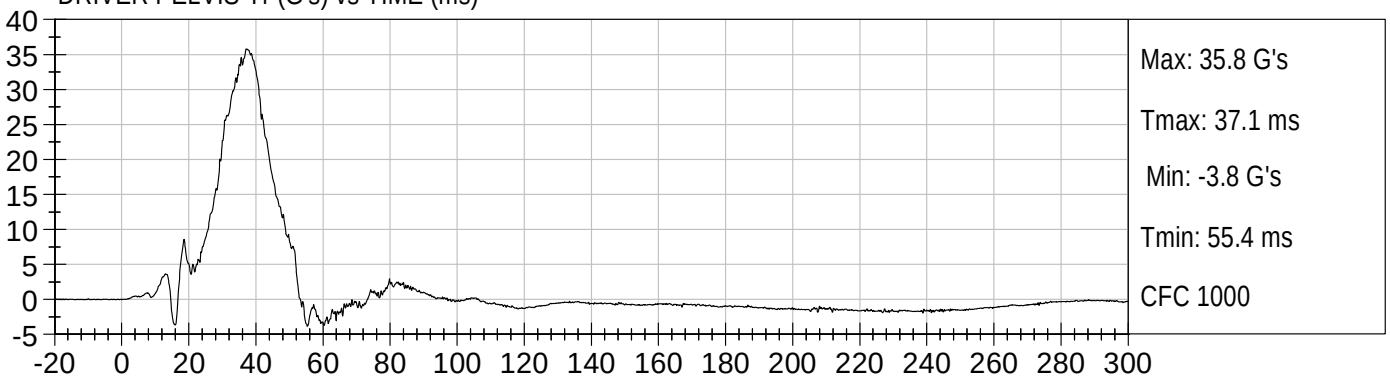
DRIVER LOWER SPINE Yr (G's) vs TIME (ms)



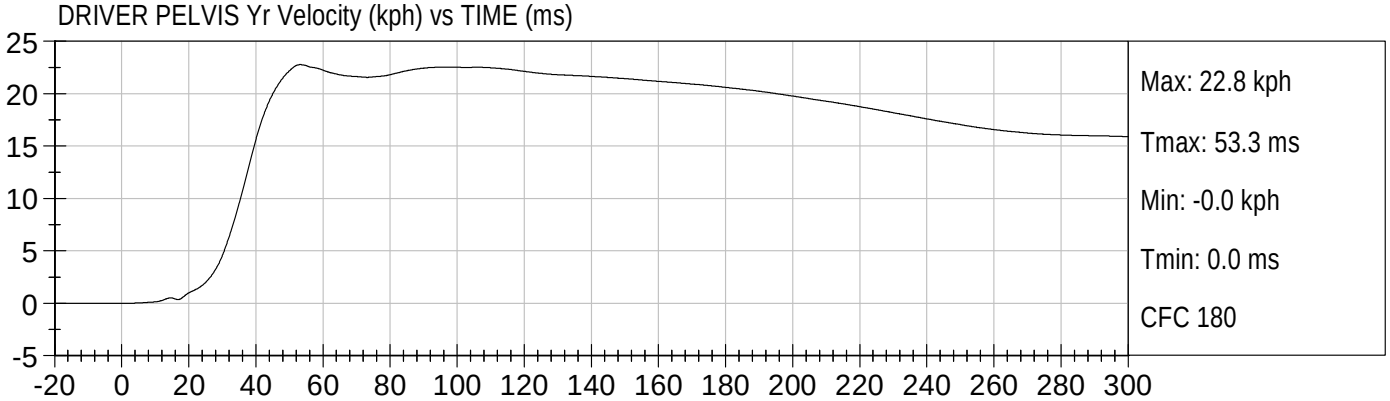
DRIVER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



DRIVER PELVIS Yr (G's) vs TIME (ms)



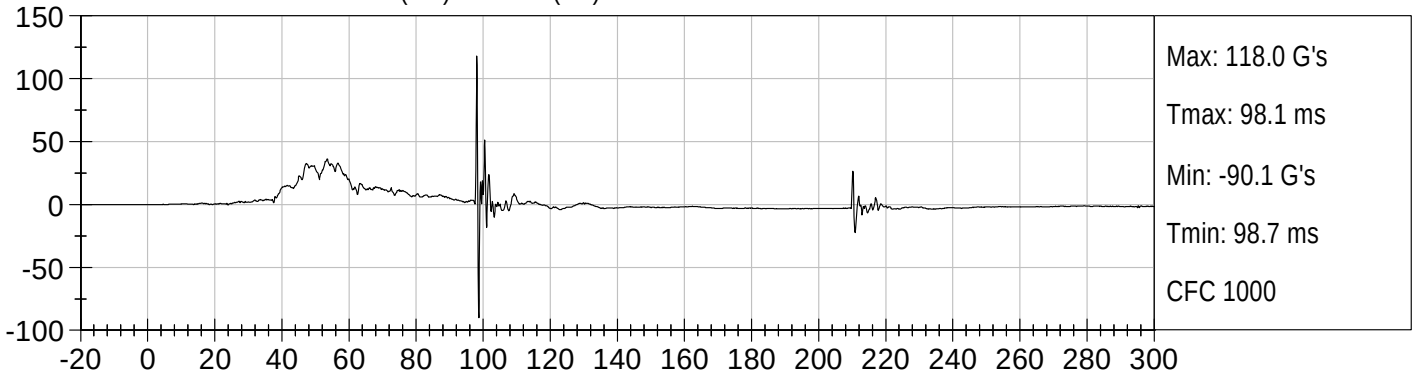
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)



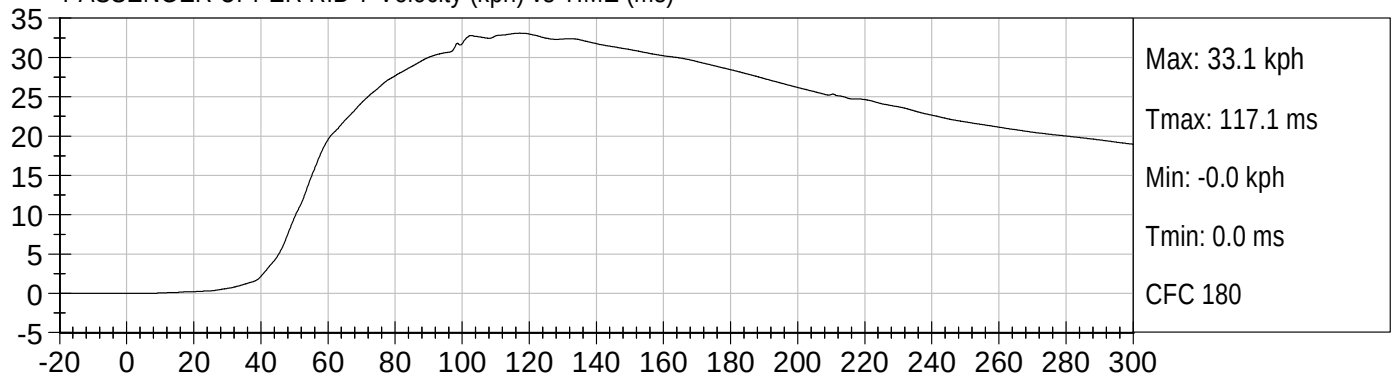
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

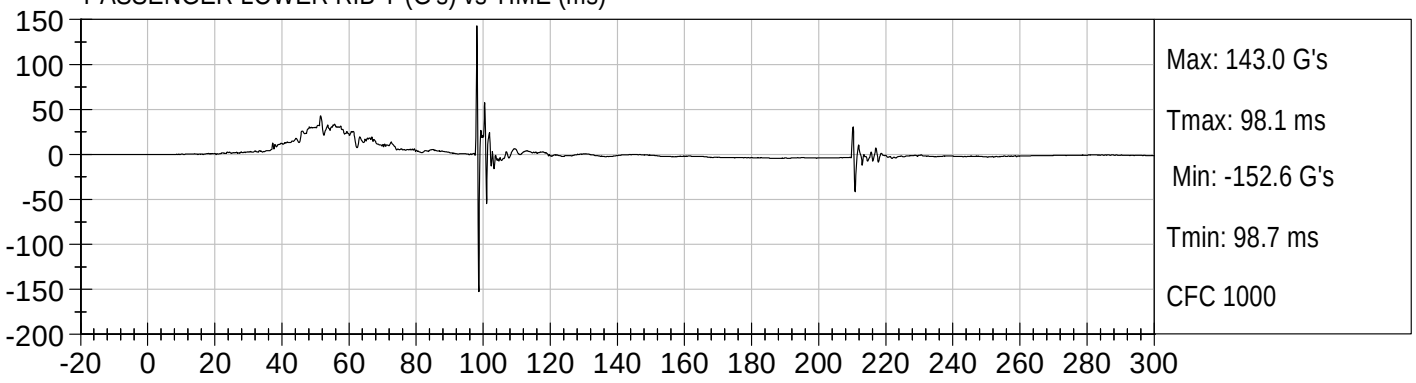
PASSENGER UPPER RIB Y (G's) vs TIME (ms)



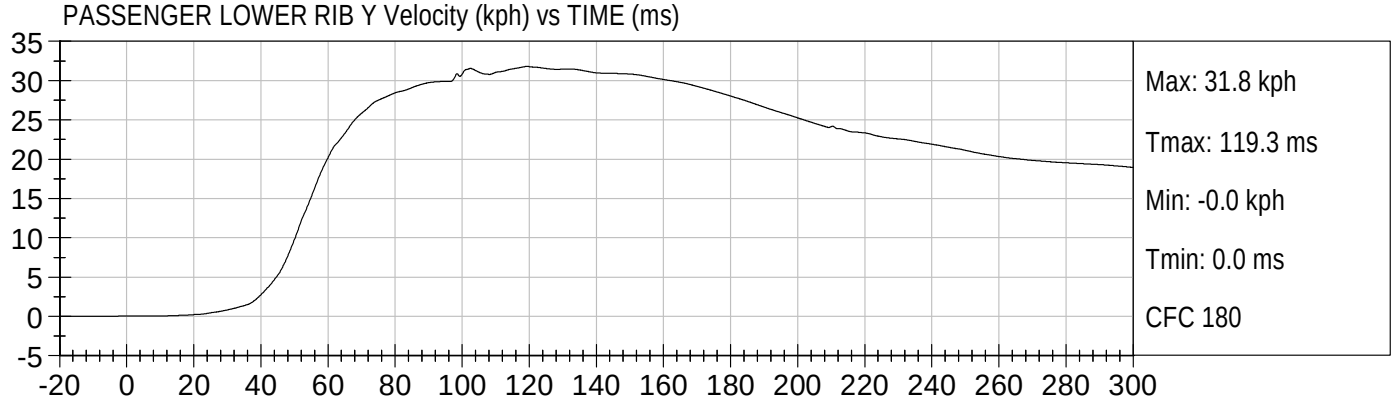
PASSENGER UPPER RIB Y Velocity (kph) vs TIME (ms)



PASSENGER LOWER RIB Y (G's) vs TIME (ms)



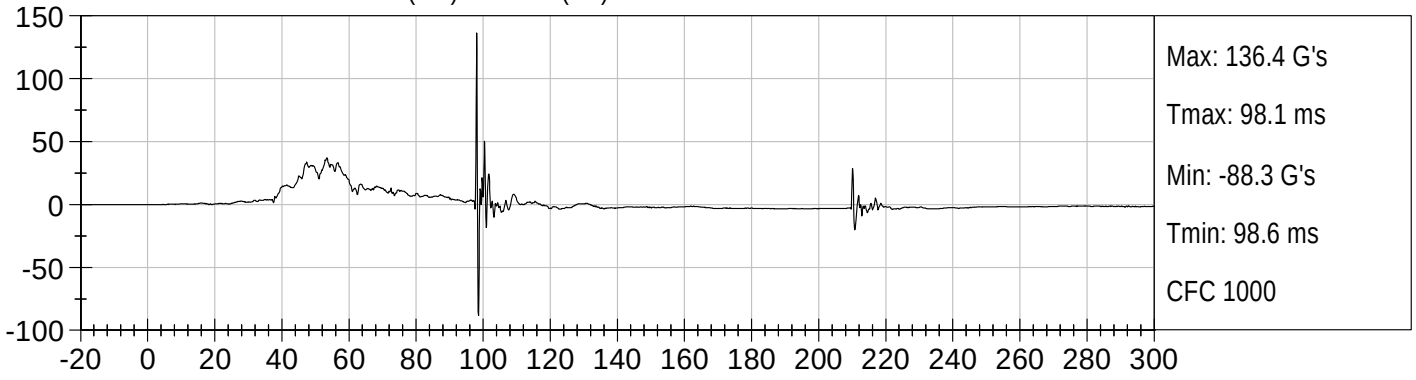
PASSENGER LOWER RIB Y Velocity (kph) vs TIME (ms)



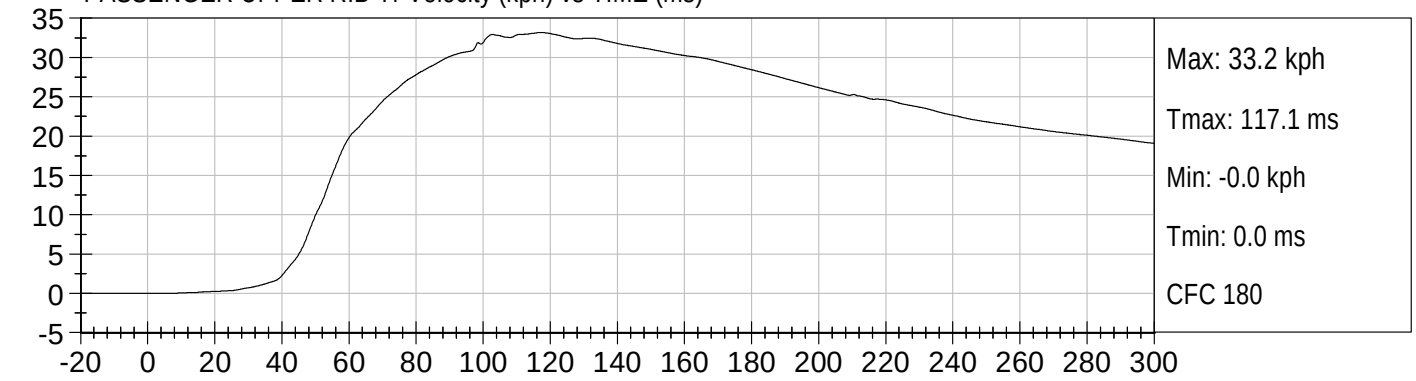
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

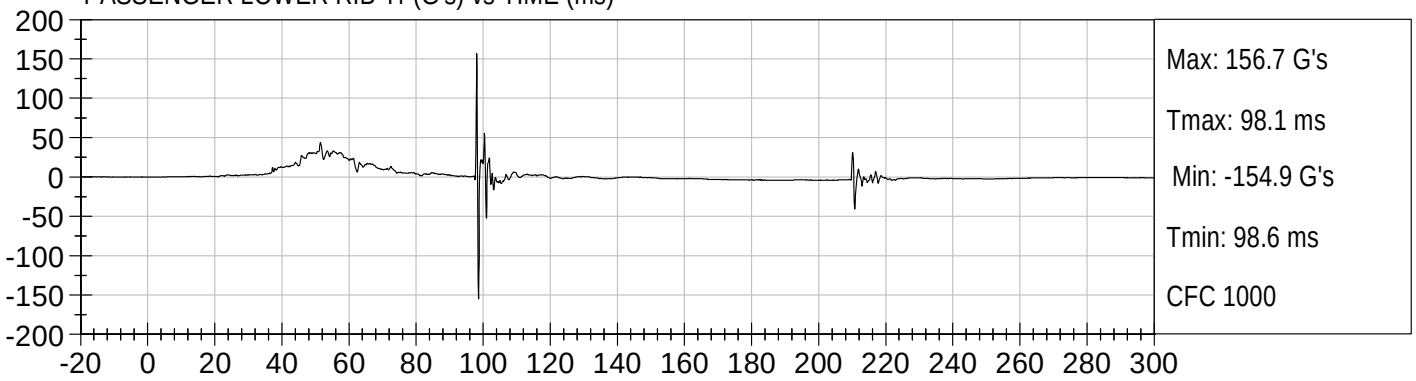
PASSENGER UPPER RIB Yr (G's) vs TIME (ms)



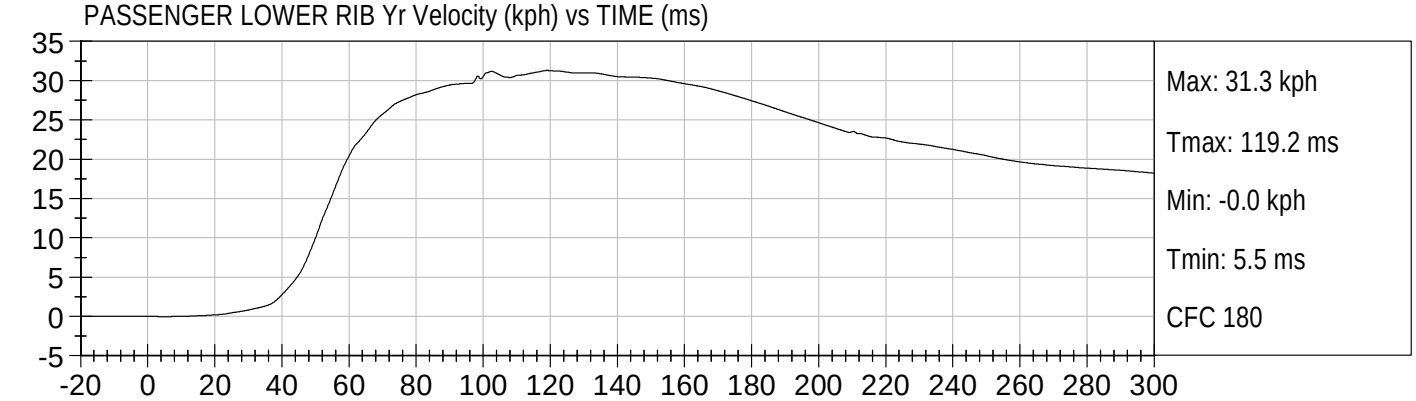
PASSENGER UPPER RIB Yr Velocity (kph) vs TIME (ms)



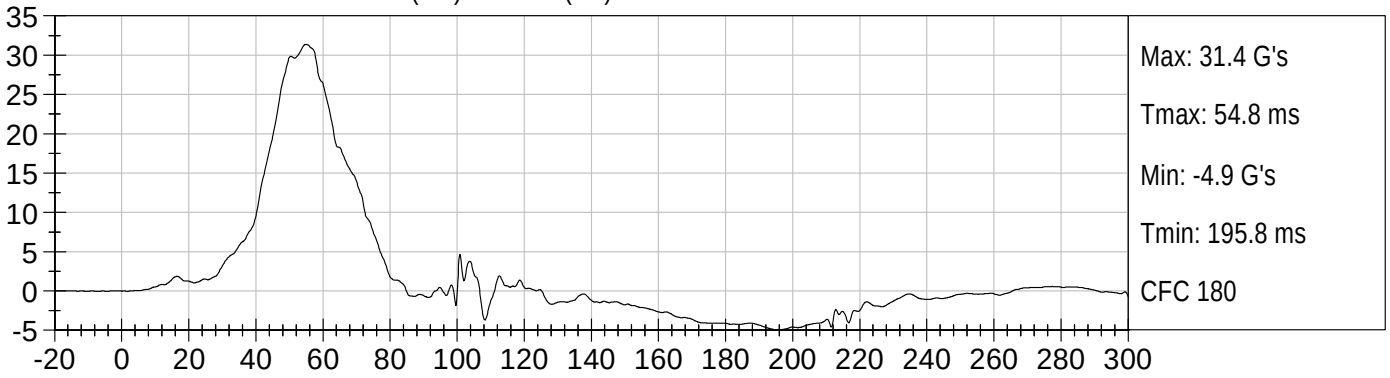
PASSENGER LOWER RIB Yr (G's) vs TIME (ms)



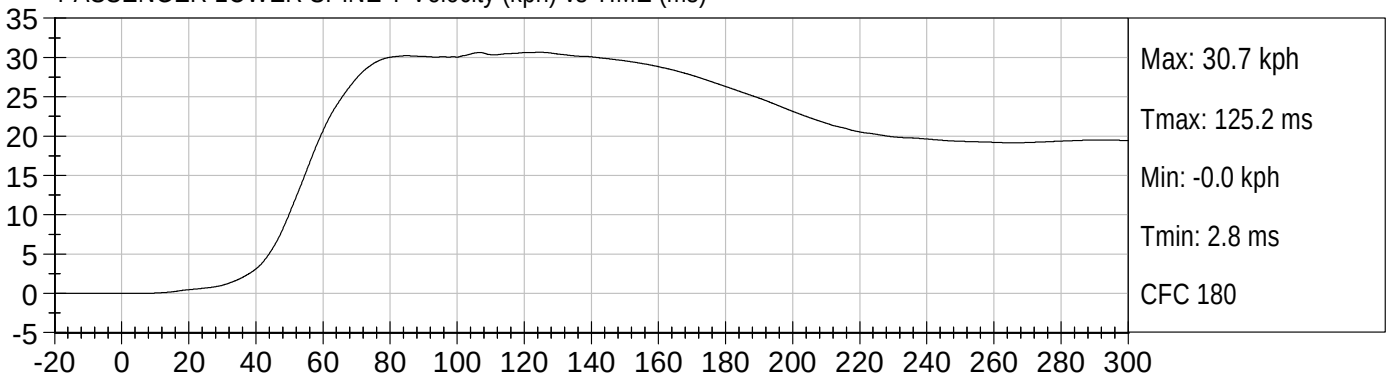
PASSENGER LOWER RIB Yr Velocity (kph) vs TIME (ms)



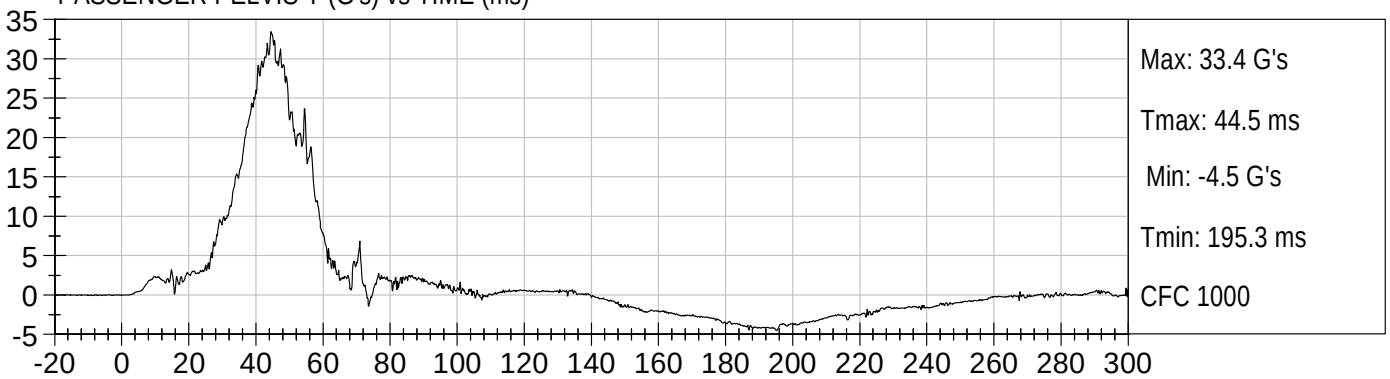
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



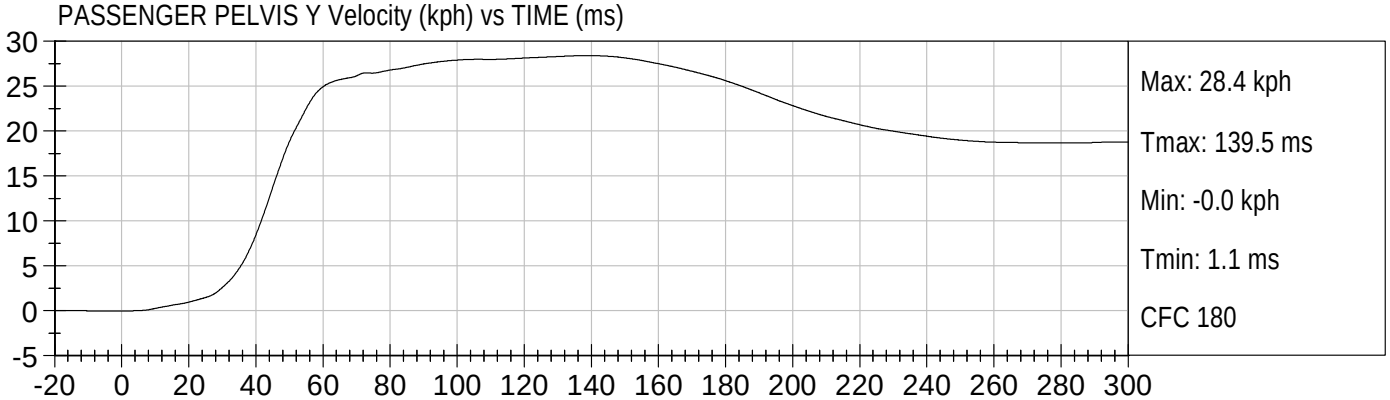
PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)



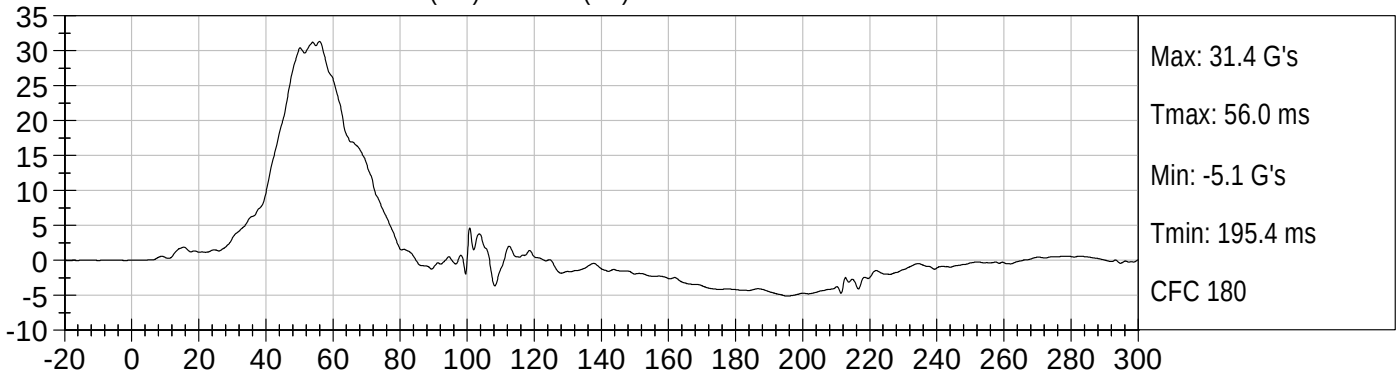
PASSENGER PELVIS Y (G's) vs TIME (ms)



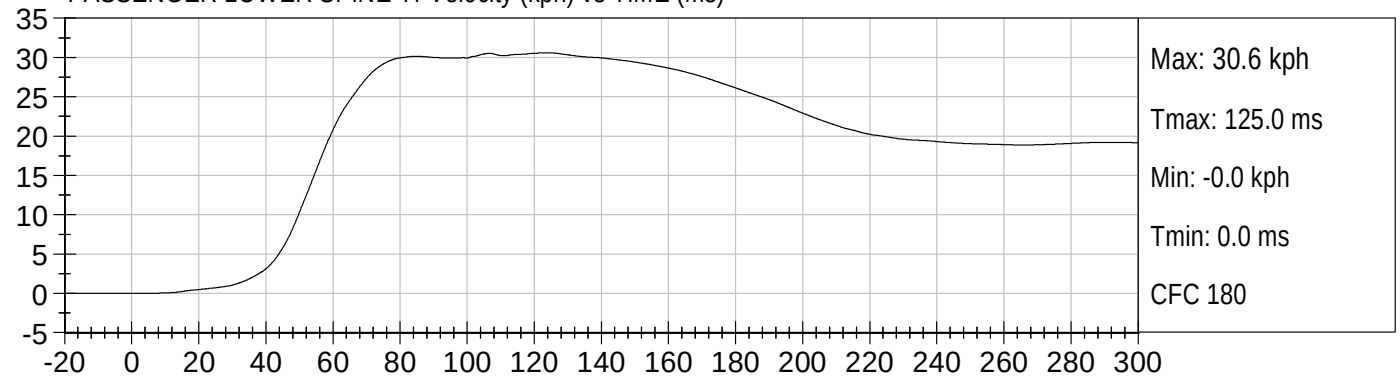
PASSENGER PELVIS Y Velocity (kph) vs TIME (ms)



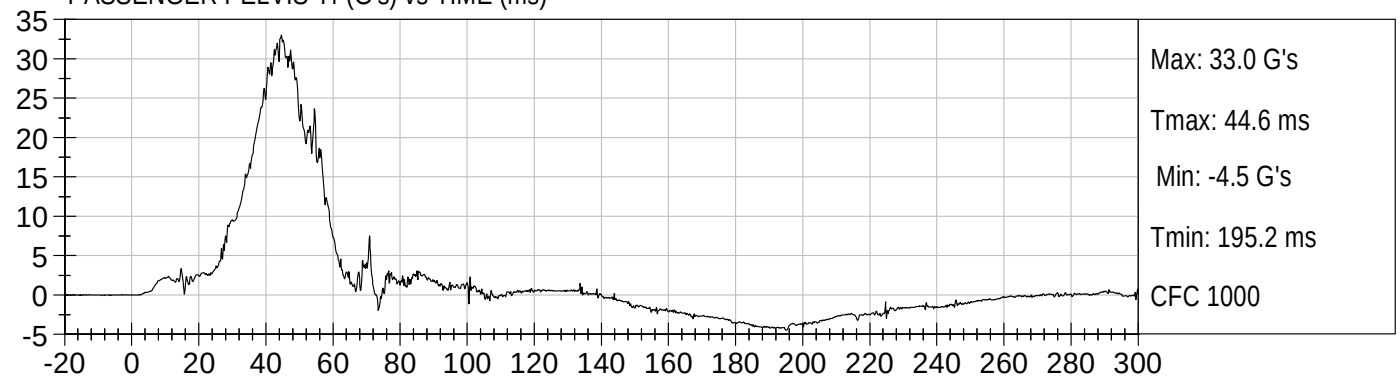
PASSENGER LOWER SPINE Yr (G's) vs TIME (ms)



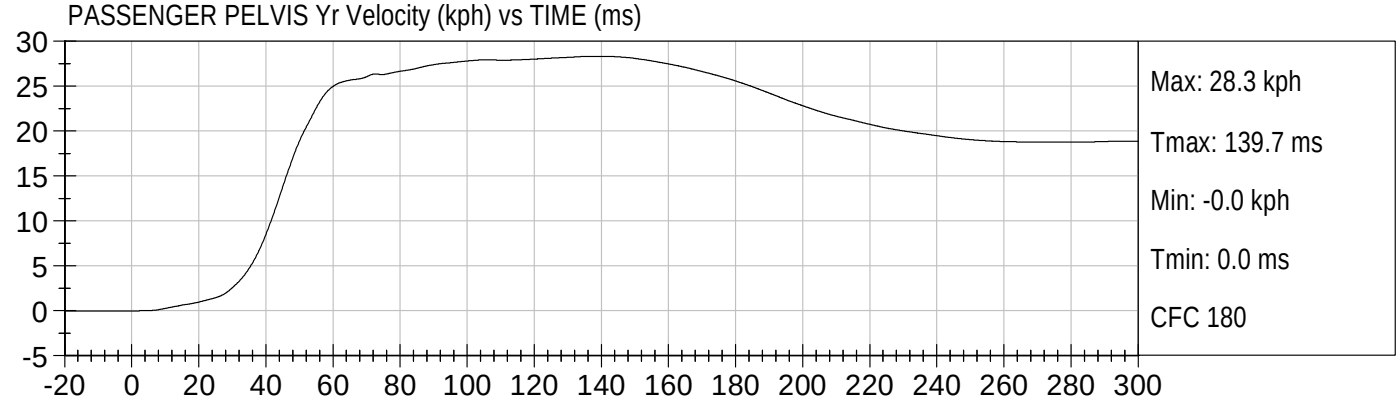
PASSENGER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



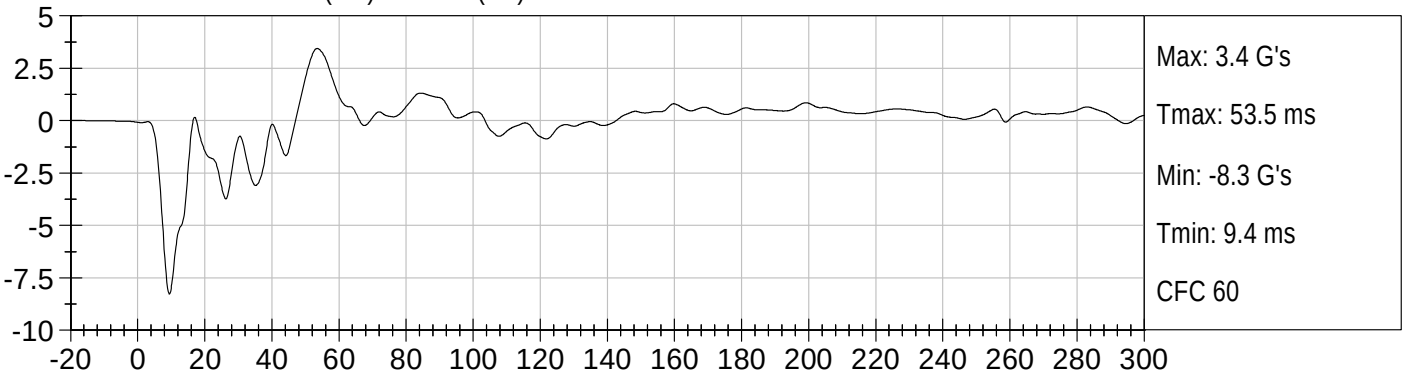
PASSENGER PELVIS Yr (G's) vs TIME (ms)



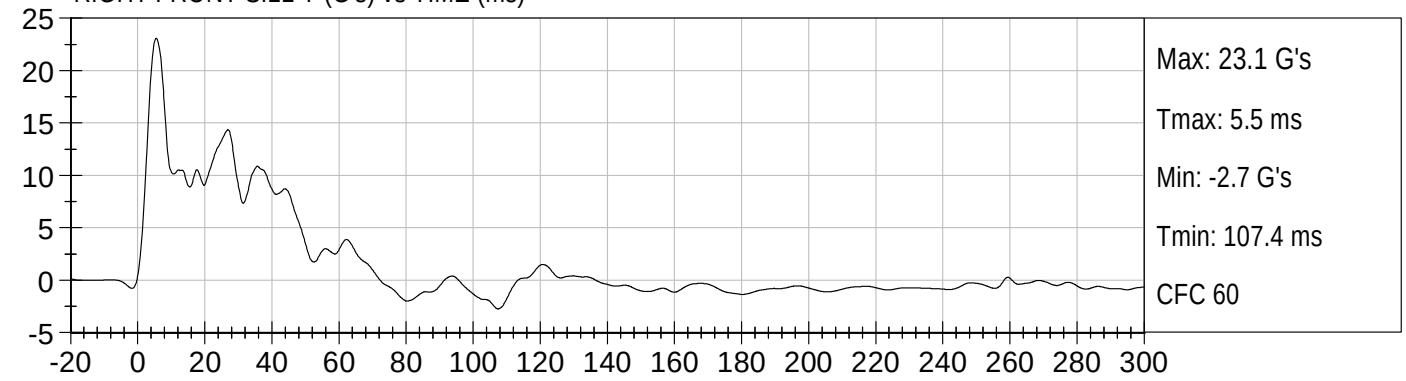
PASSENGER PELVIS Yr Velocity (kph) vs TIME (ms)



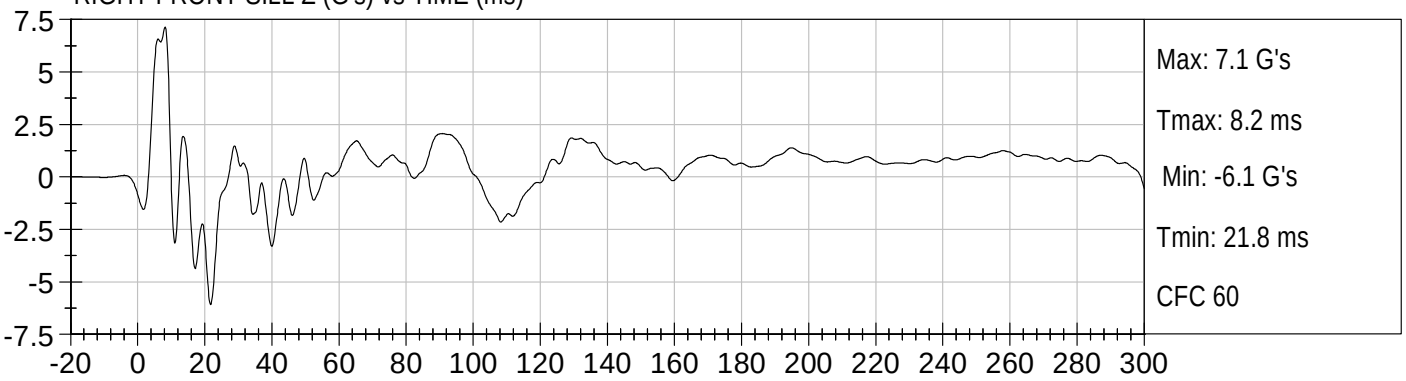
RIGHT FRONT SILL X (G's) vs TIME (ms)



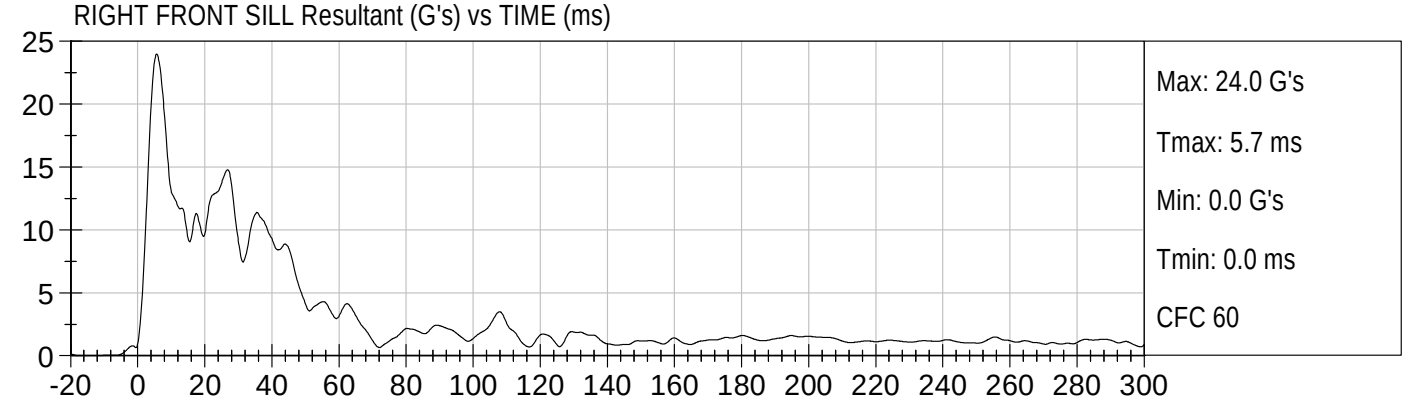
RIGHT FRONT SILL Y (G's) vs TIME (ms)



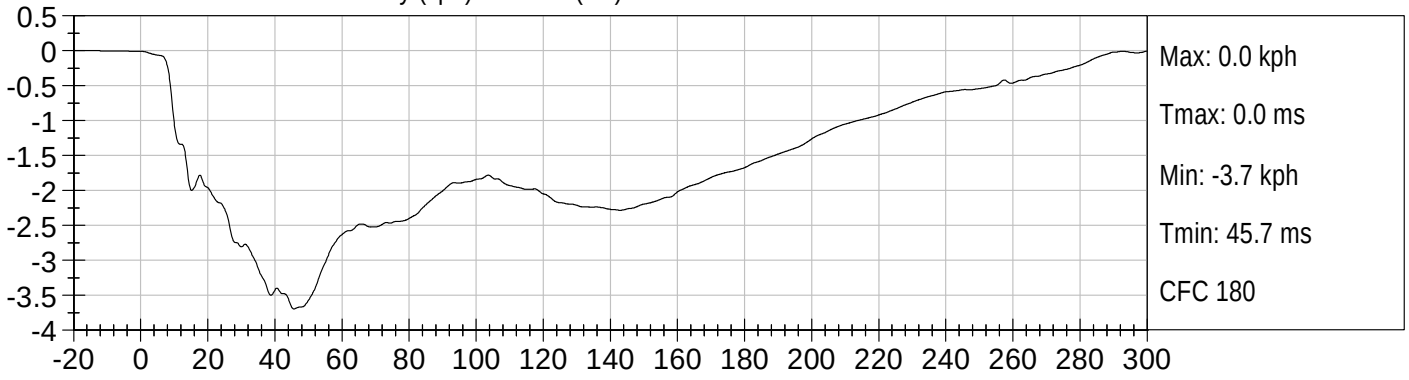
RIGHT FRONT SILL Z (G's) vs TIME (ms)



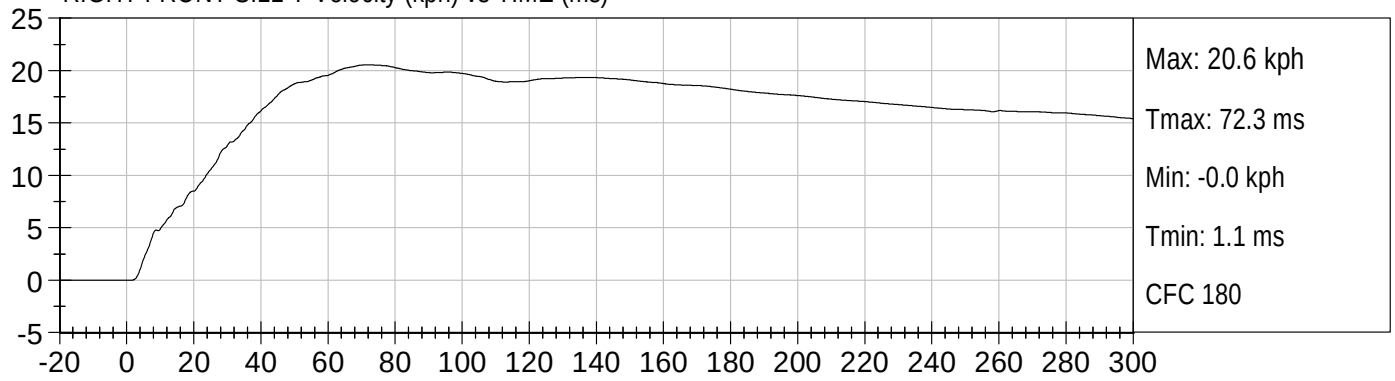
RIGHT FRONT SILL Resultant (G's) vs TIME (ms)



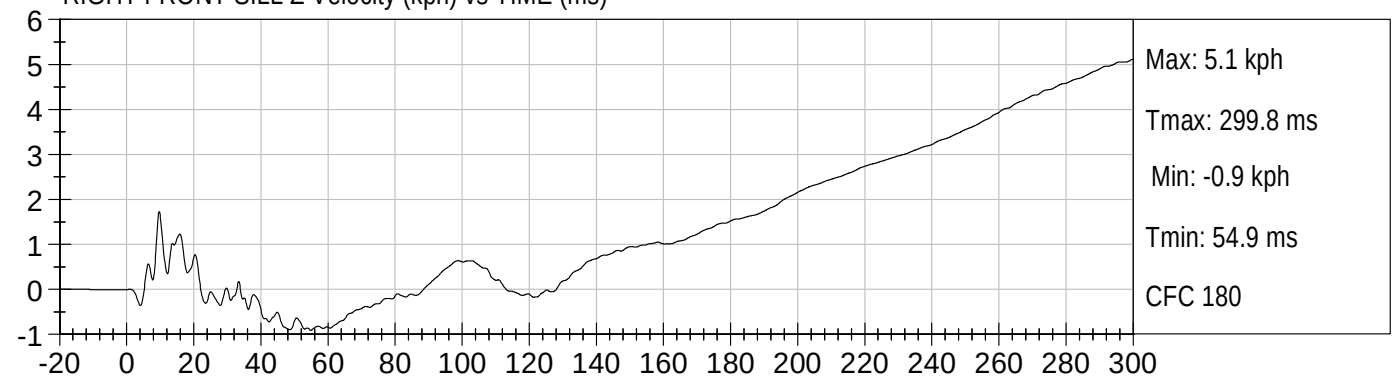
RIGHT FRONT SILL X Velocity (kph) vs TIME (ms)



RIGHT FRONT SILL Y Velocity (kph) vs TIME (ms)



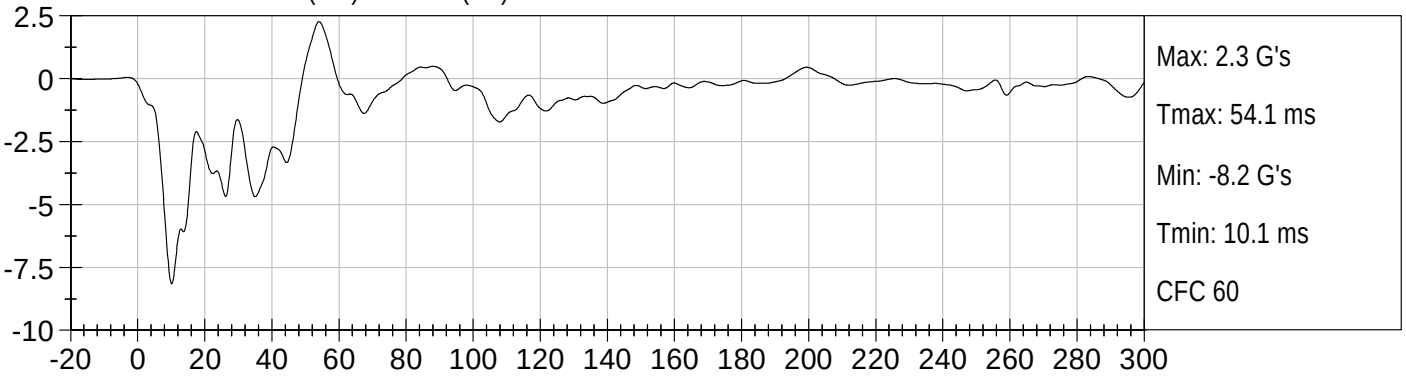
RIGHT FRONT SILL Z Velocity (kph) vs TIME (ms)



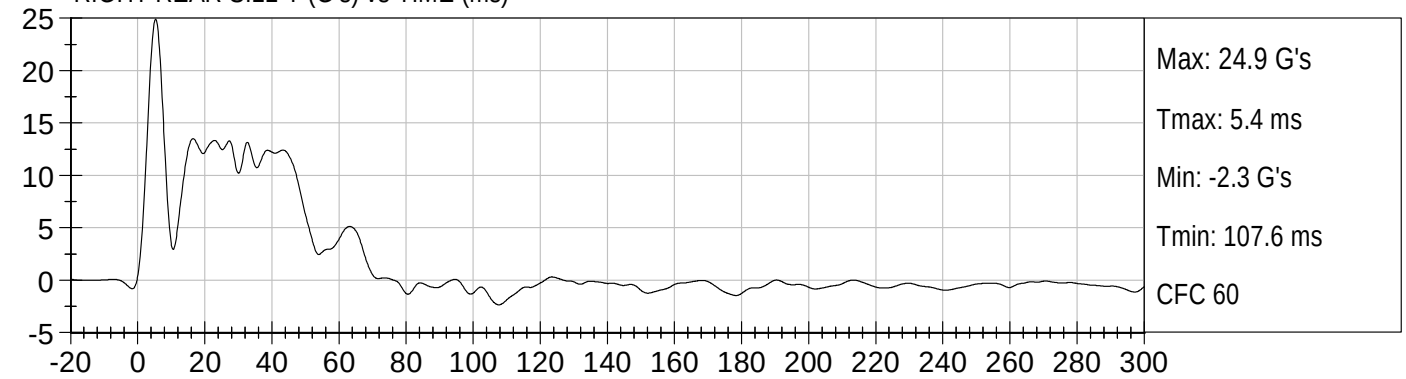
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

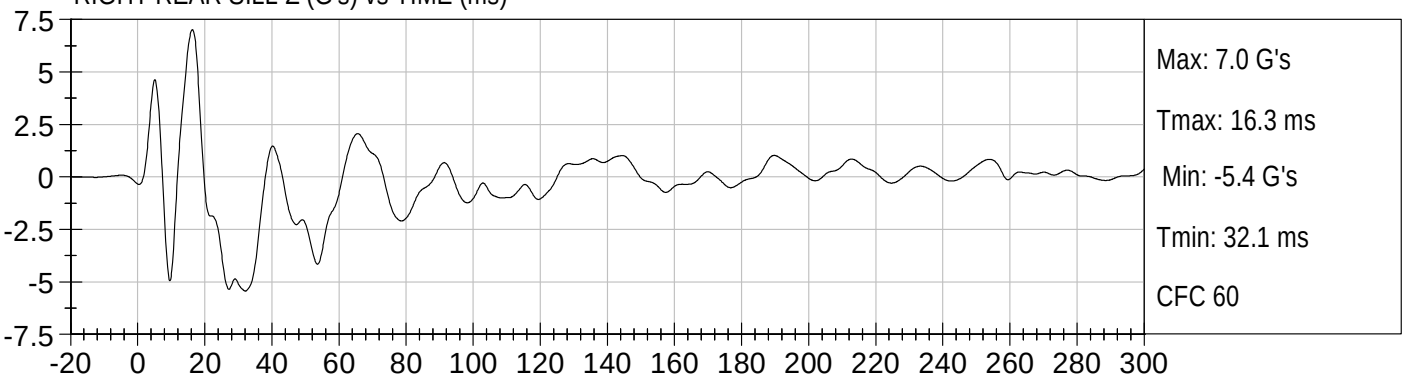
RIGHT REAR SILL X (G's) vs TIME (ms)



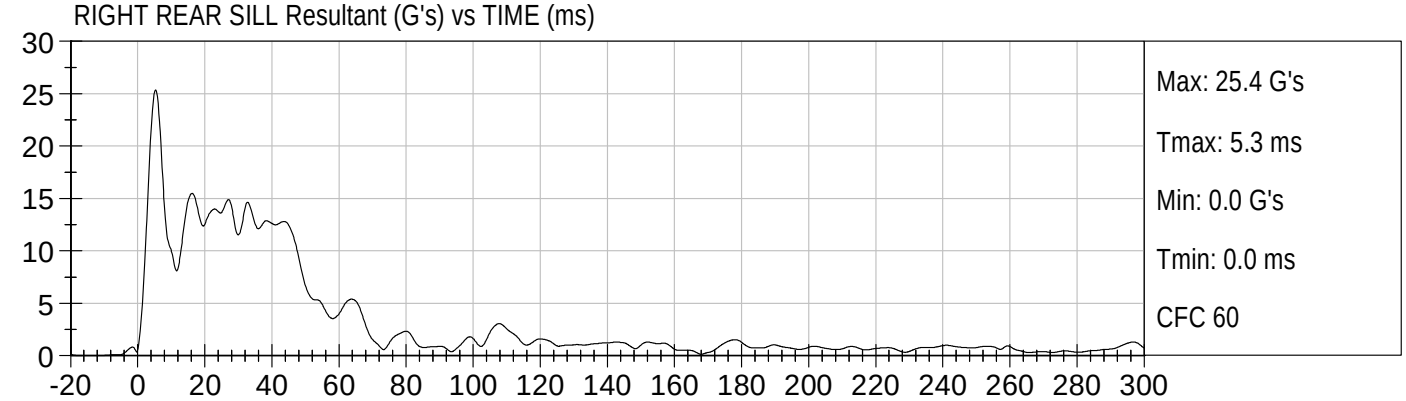
RIGHT REAR SILL Y (G's) vs TIME (ms)

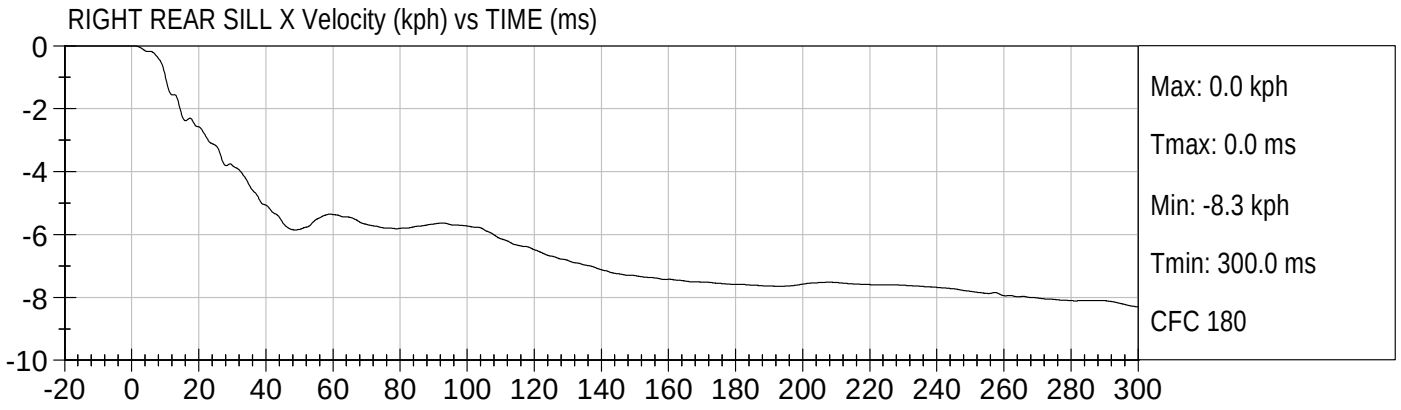


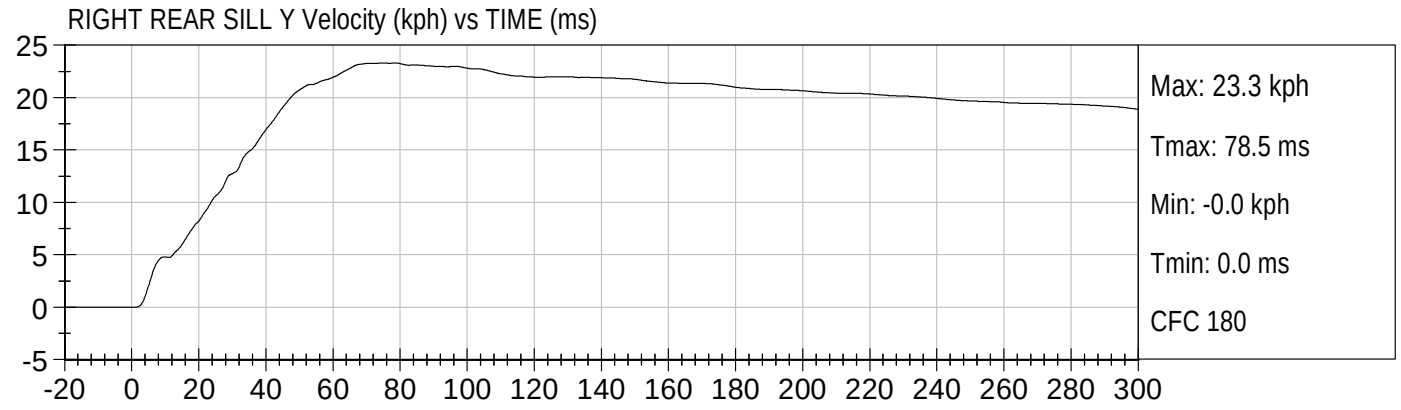
RIGHT REAR SILL Z (G's) vs TIME (ms)

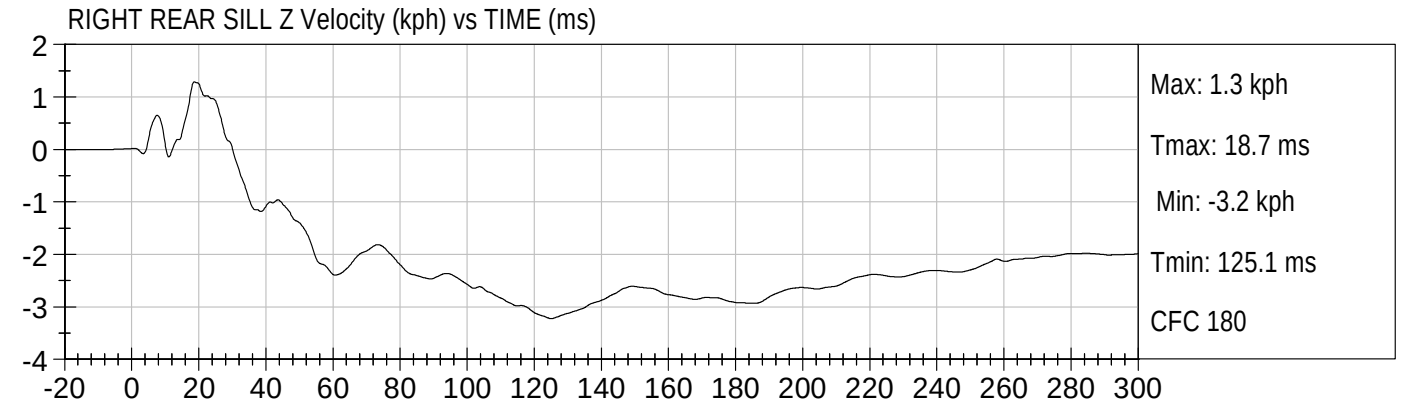


RIGHT REAR SILL Resultant (G's) vs TIME (ms)

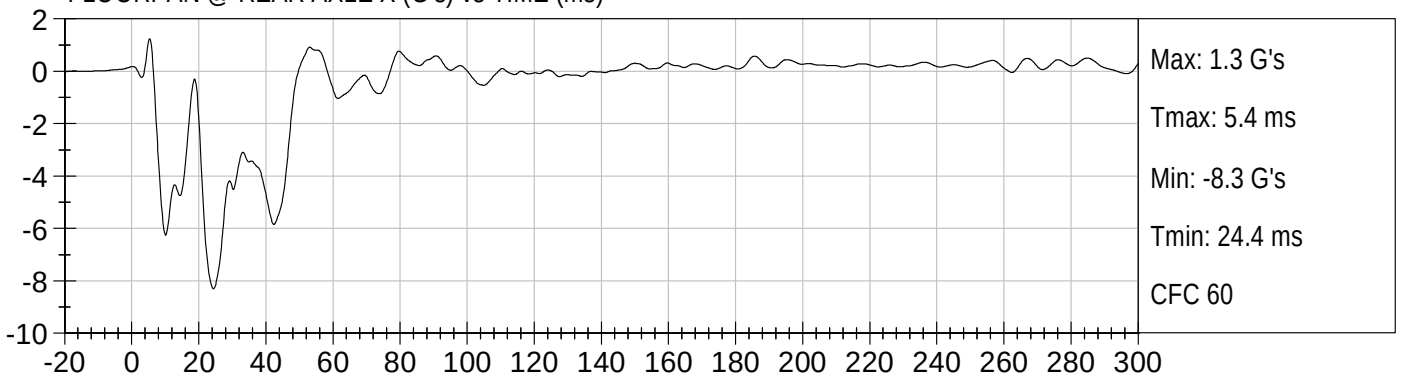



RIGHT REAR SILL X Velocity (kph) vs TIME (ms)
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -8.3 kph
Tmin: 300.0 ms
CFC 180

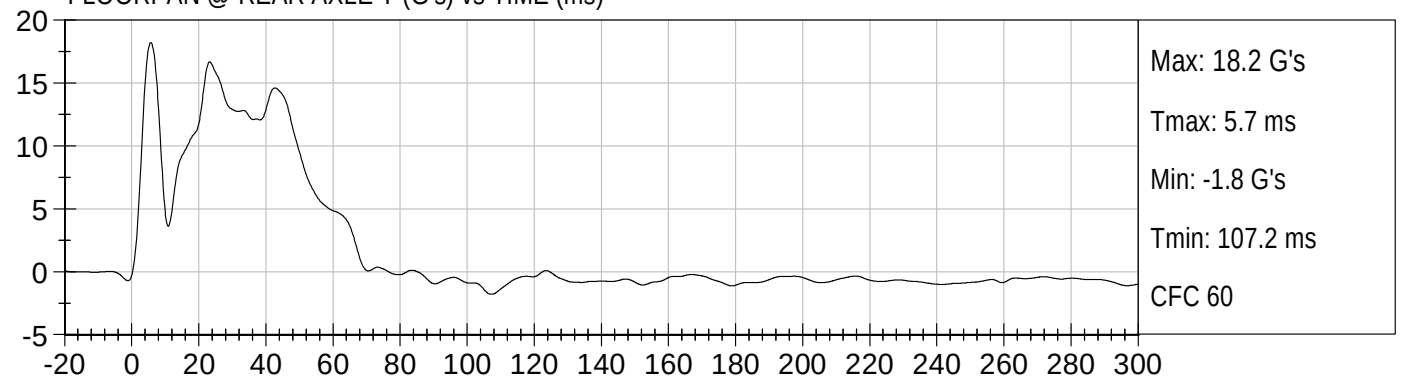

RIGHT REAR SILL Y Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 23.3 kph
Tmax: 78.5 ms
Min: -0.0 kph
Tmin: 0.0 ms
CFC 180


RIGHT REAR SILL Z Velocity (kph) vs TIME (ms)
2
1
0
-1
-2
-3
-4
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.3 kph
Tmax: 18.7 ms
Min: -3.2 kph
Tmin: 125.1 ms
CFC 180

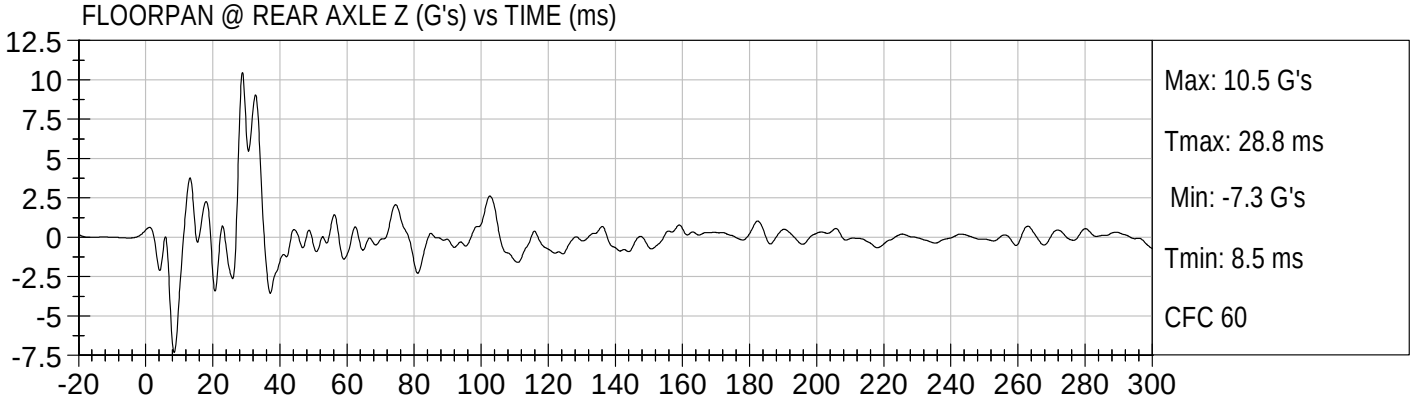
FLOORPAN @ REAR AXLE X (G's) vs TIME (ms)



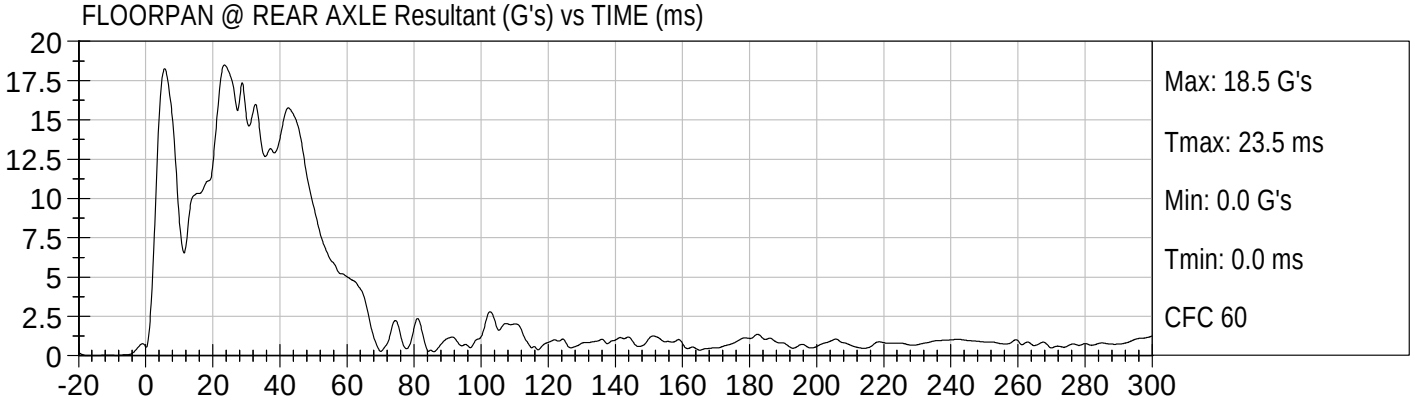
FLOORPAN @ REAR AXLE Y (G's) vs TIME (ms)



FLOORPAN @ REAR AXLE Z (G's) vs TIME (ms)



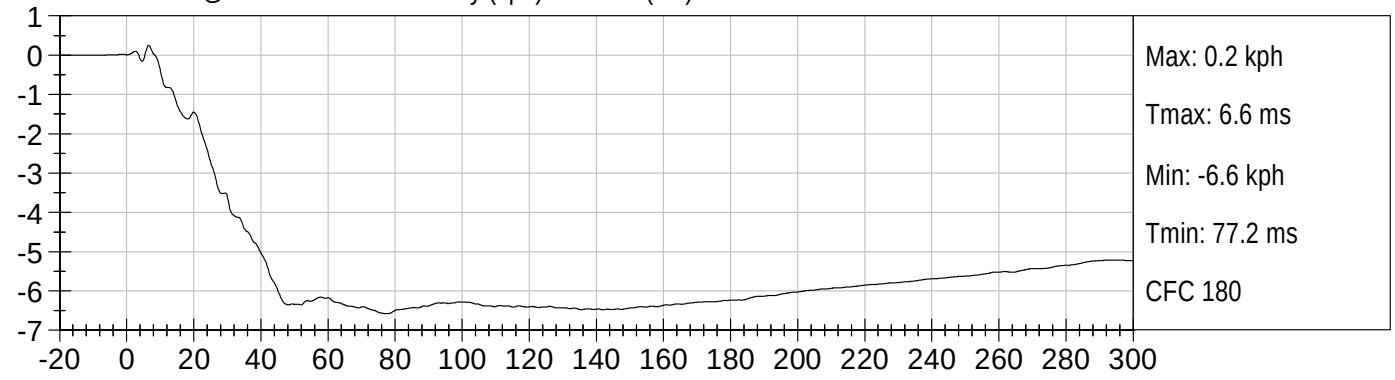
FLOORPAN @ REAR AXLE Resultant (G's) vs TIME (ms)



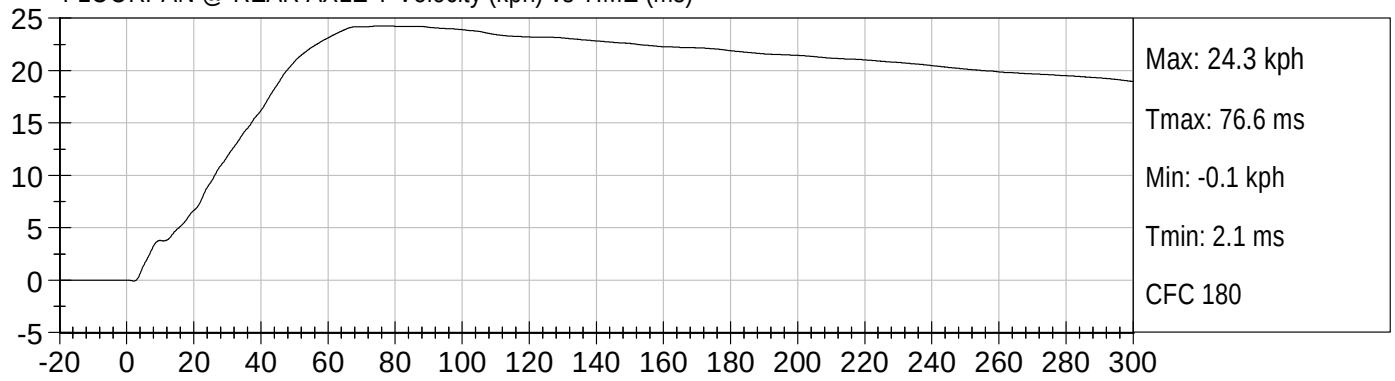
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

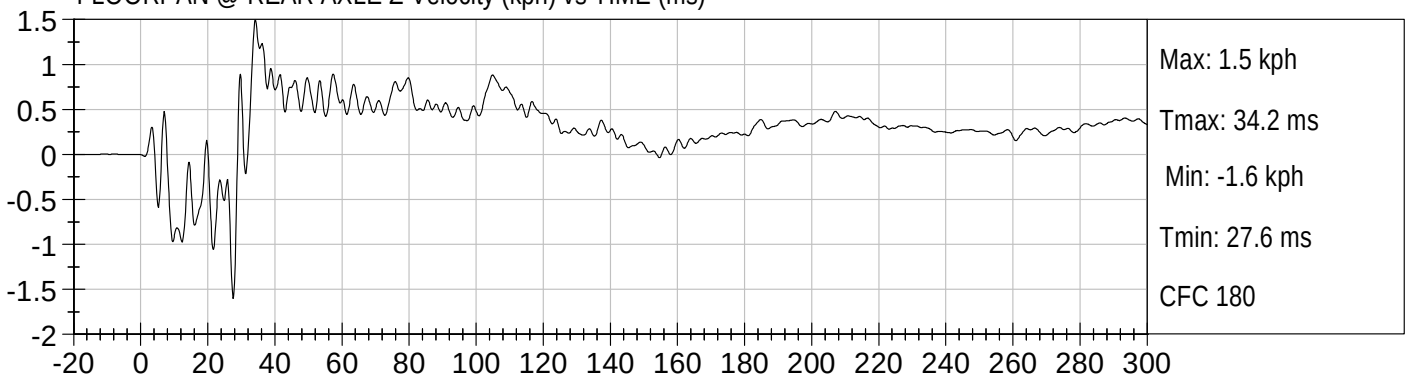
FLOORPAN @ REAR AXLE X Velocity (kph) vs TIME (ms)



FLOORPAN @ REAR AXLE Y Velocity (kph) vs TIME (ms)



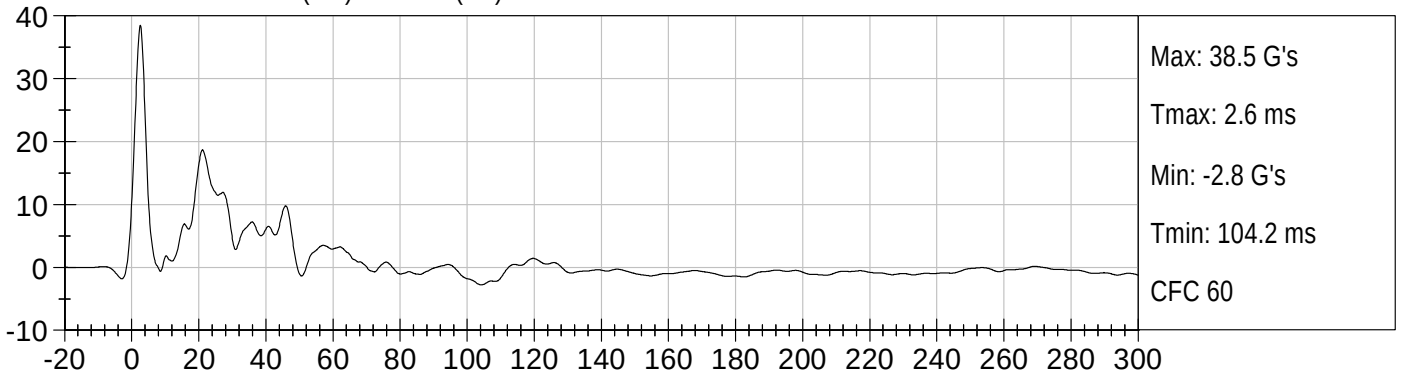
FLOORPAN @ REAR AXLE Z Velocity (kph) vs TIME (ms)



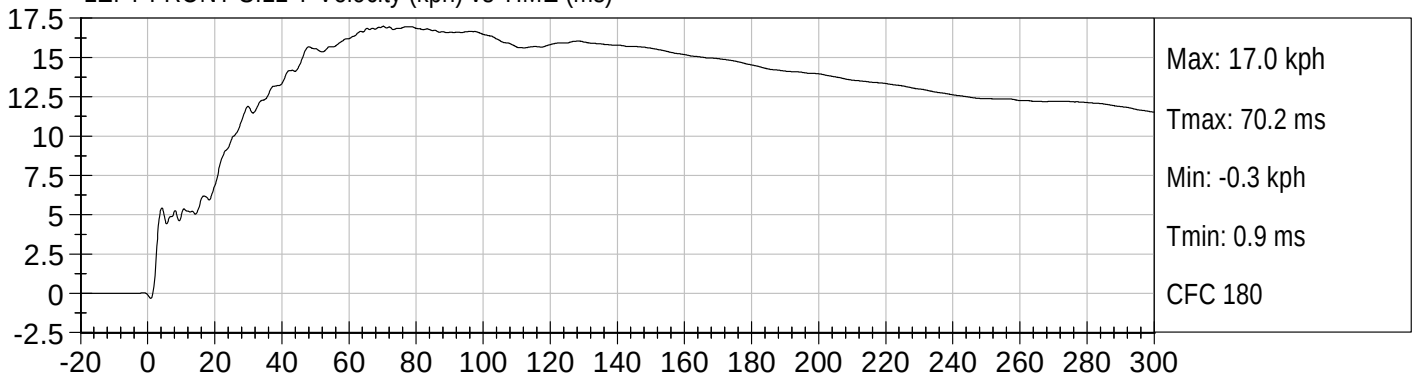
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

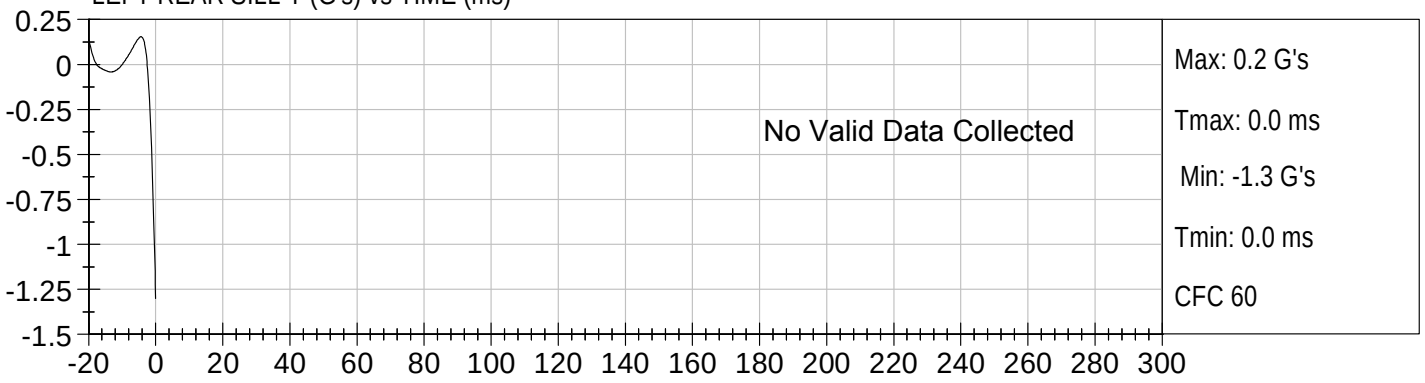
LEFT FRONT SILL Y (G's) vs TIME (ms)



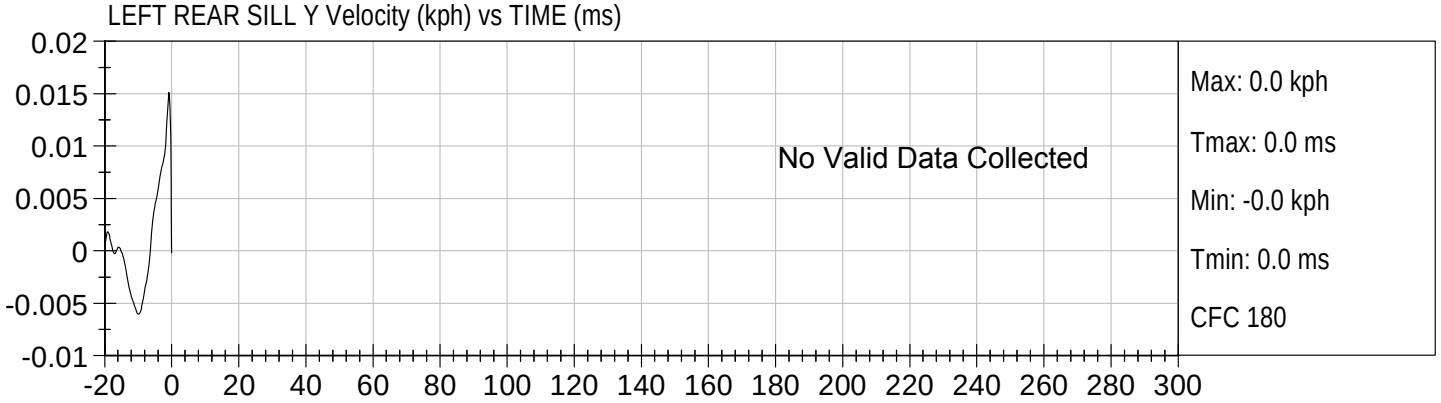
LEFT FRONT SILL Y Velocity (kph) vs TIME (ms)



LEFT REAR SILL Y (G's) vs TIME (ms)



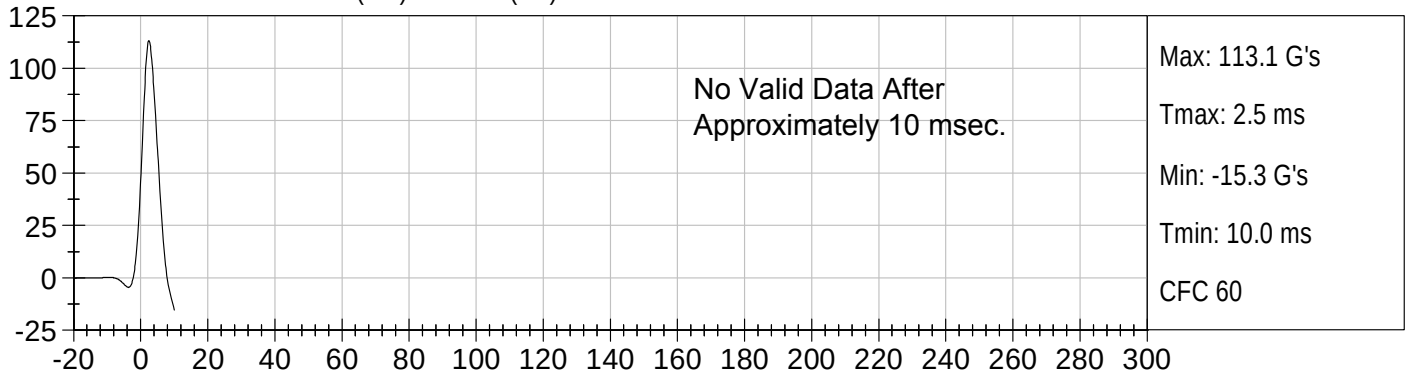
LEFT REAR SILL Y Velocity (kph) vs TIME (ms)



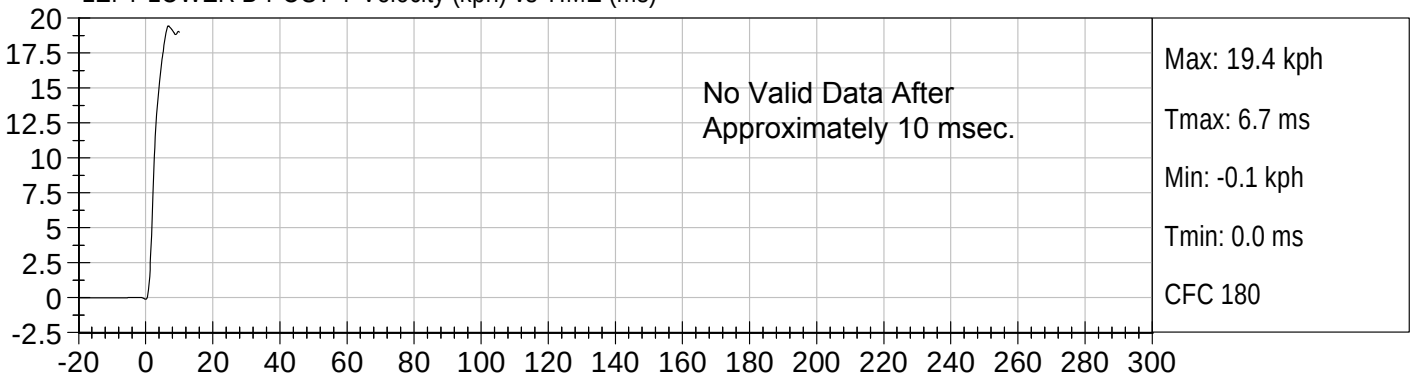
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

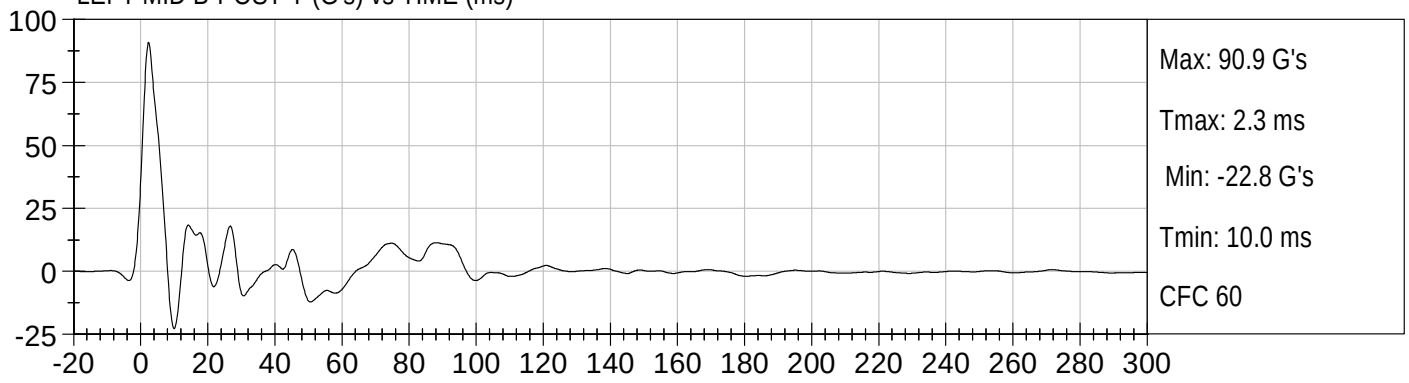
LEFT LOWER B-POST Y (G's) vs TIME (ms)



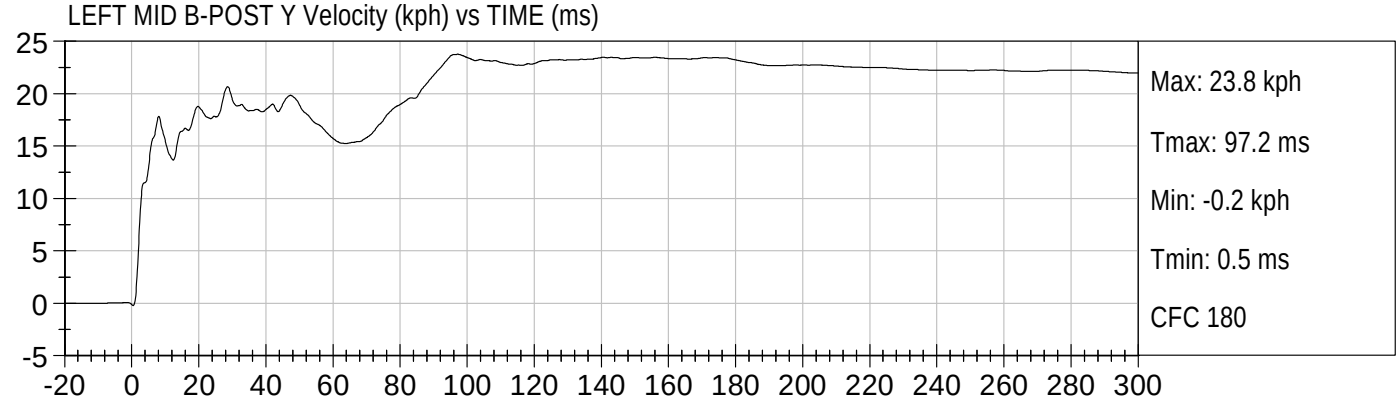
LEFT LOWER B-POST Y Velocity (kph) vs TIME (ms)



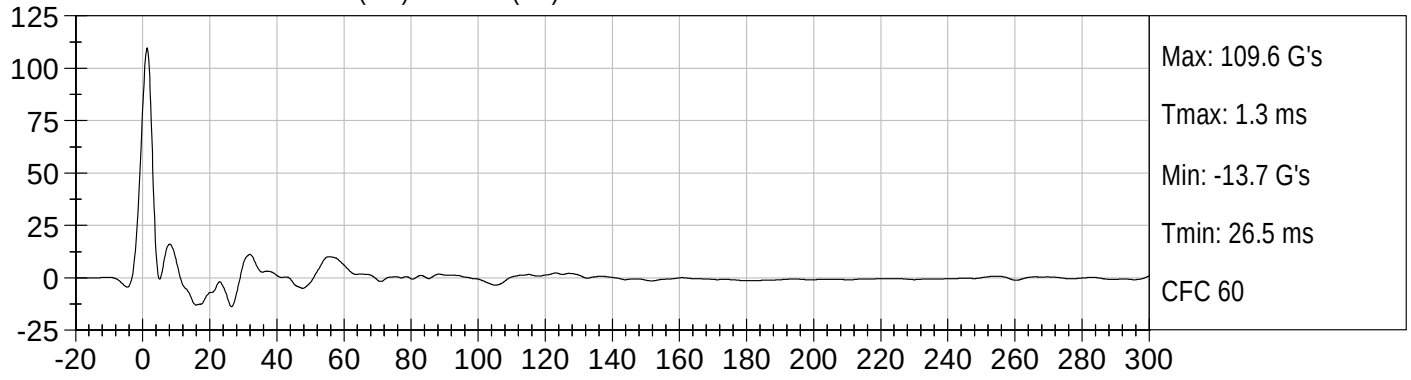
LEFT MID B-POST Y (G's) vs TIME (ms)



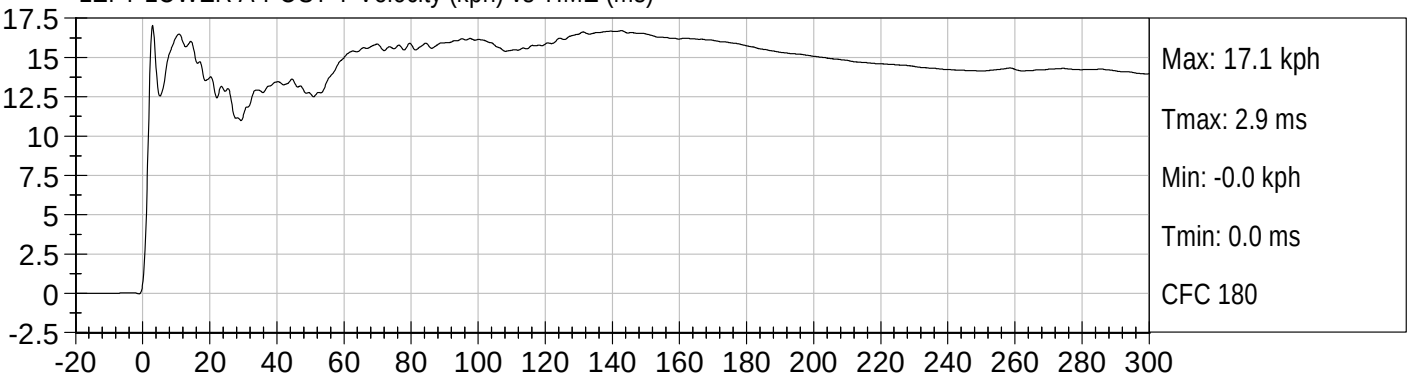
LEFT MID B-POST Y Velocity (kph) vs TIME (ms)



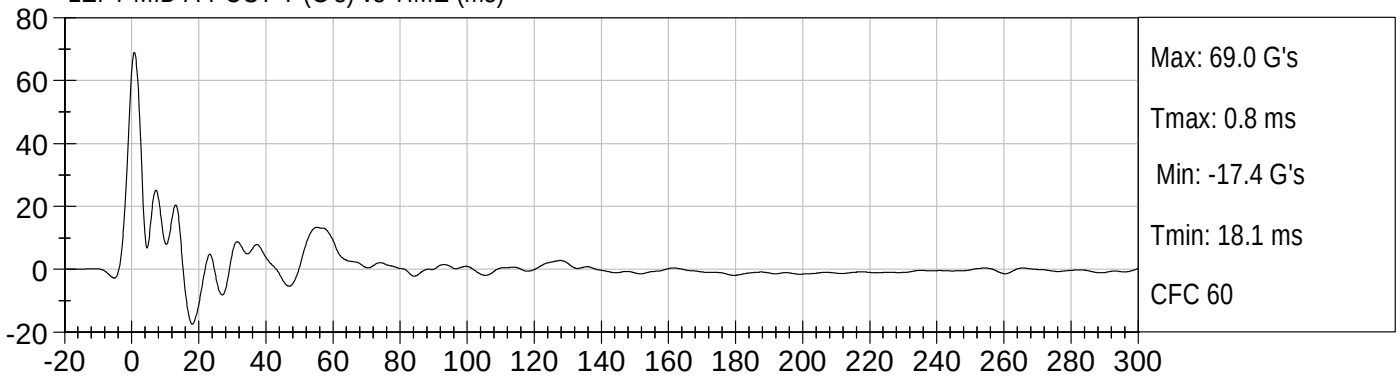
LEFT LOWER A-POST Y (G's) vs TIME (ms)



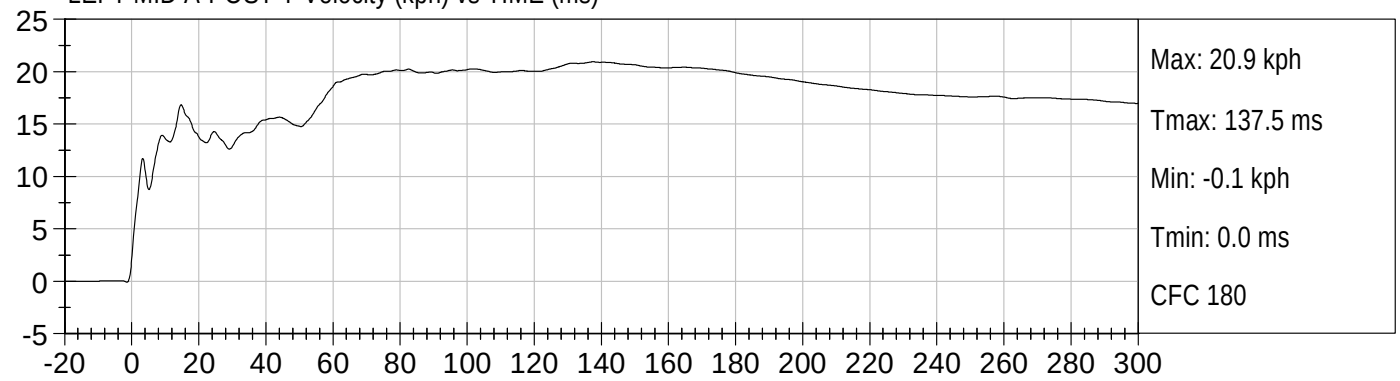
LEFT LOWER A-POST Y Velocity (kph) vs TIME (ms)



LEFT MID A-POST Y (G's) vs TIME (ms)

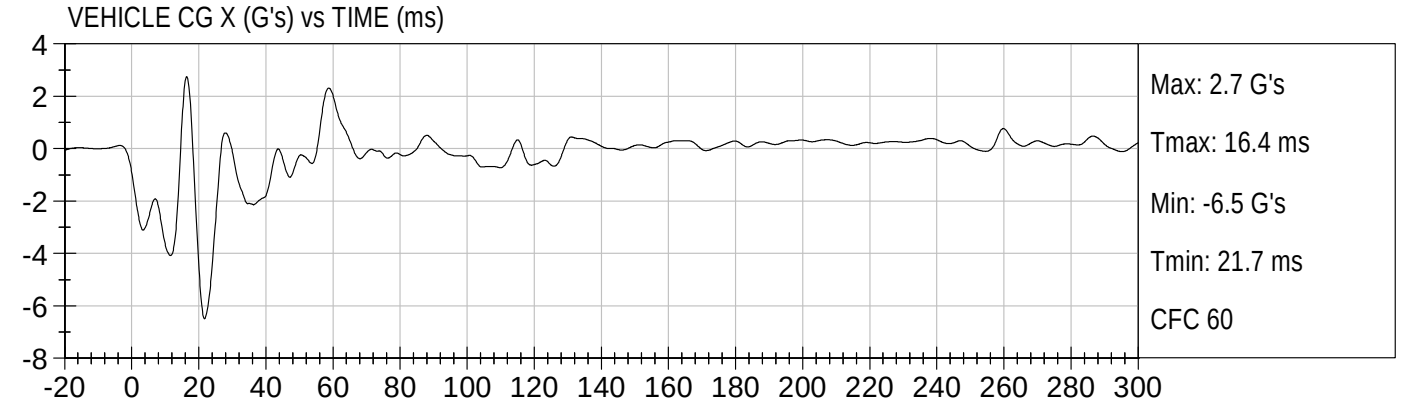


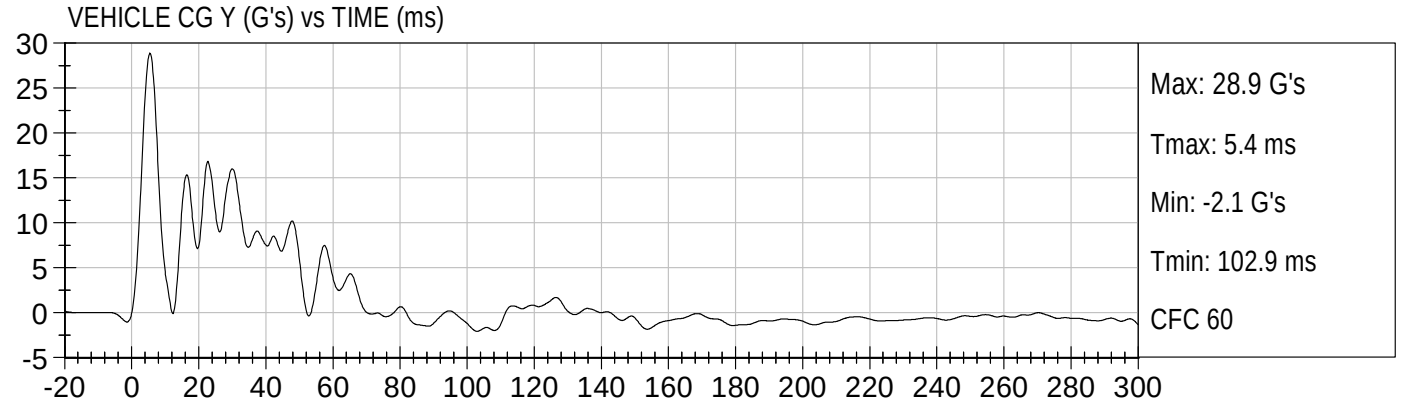
LEFT MID A-POST Y Velocity (kph) vs TIME (ms)

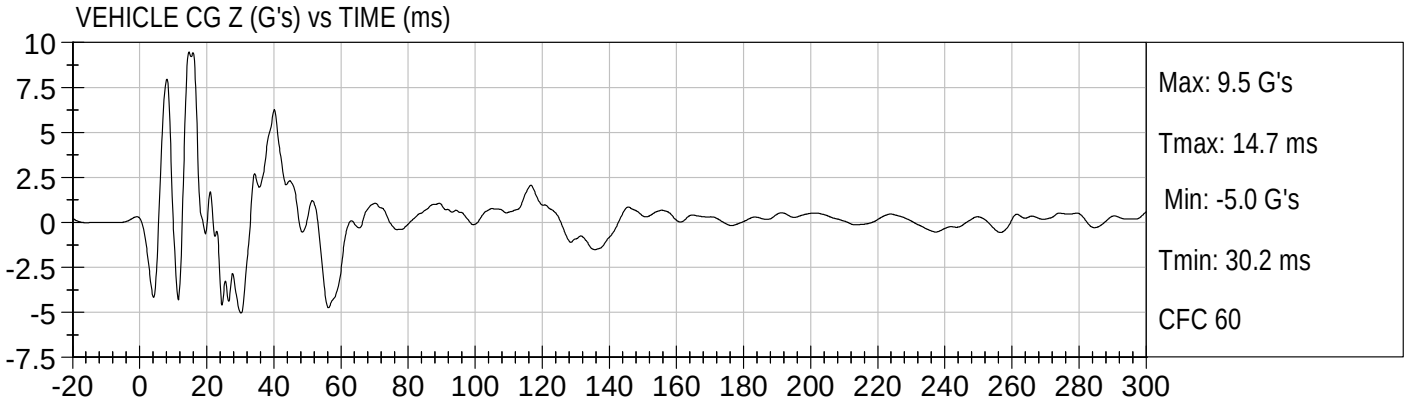


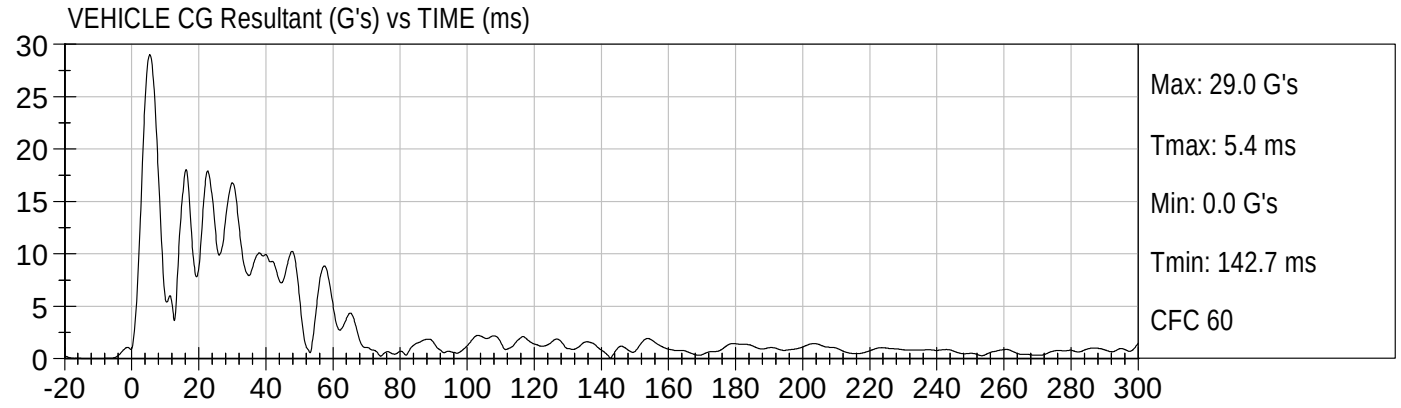
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

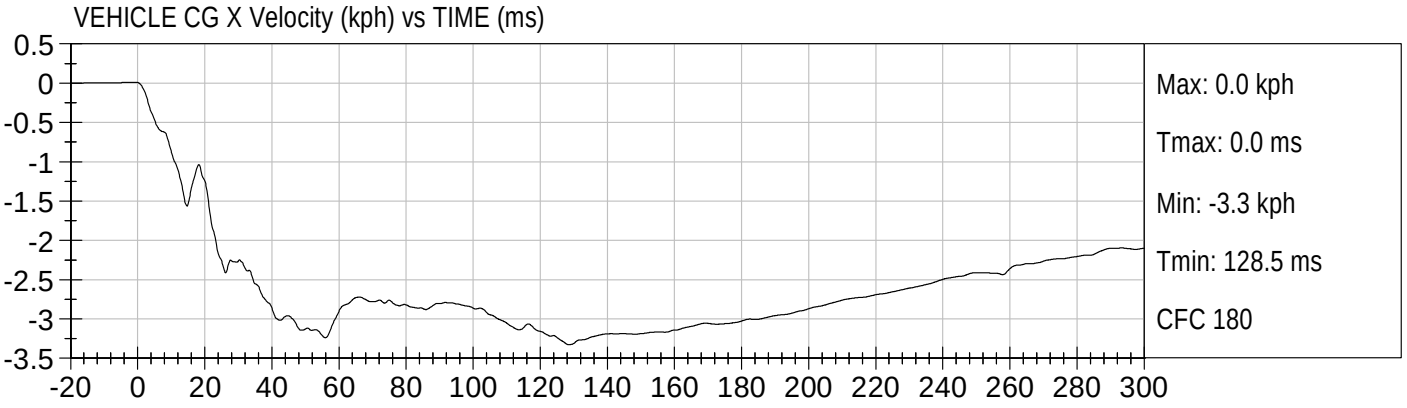
Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

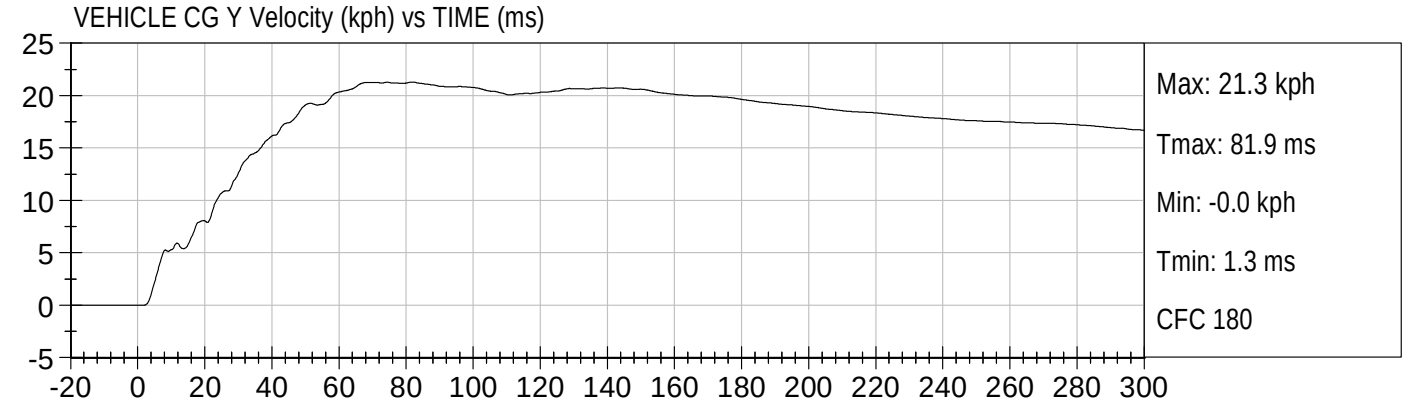


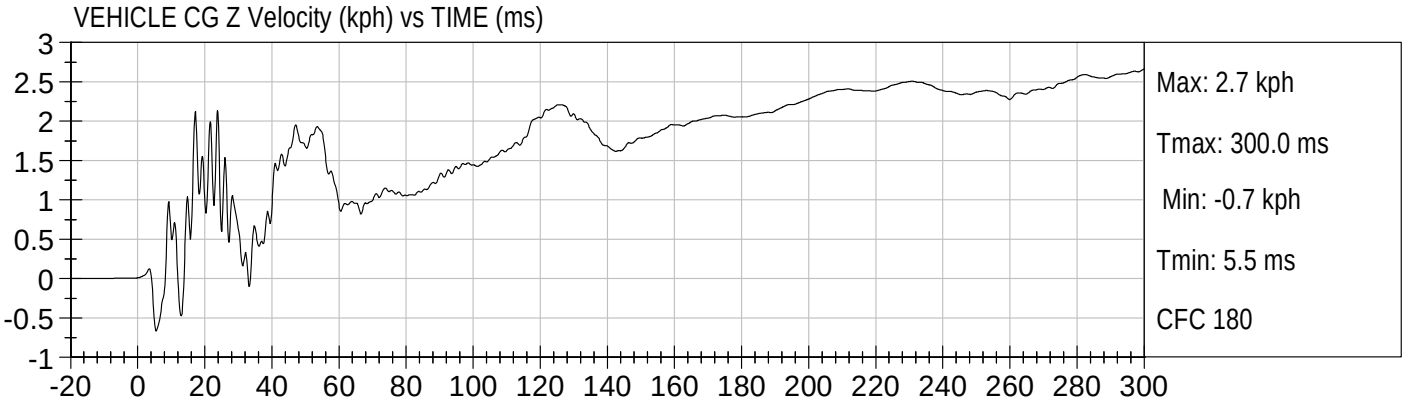







VEHICLE CG X Velocity (kph) vs TIME (ms)
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -3.3 kph
Tmin: 128.5 ms
CFC 180

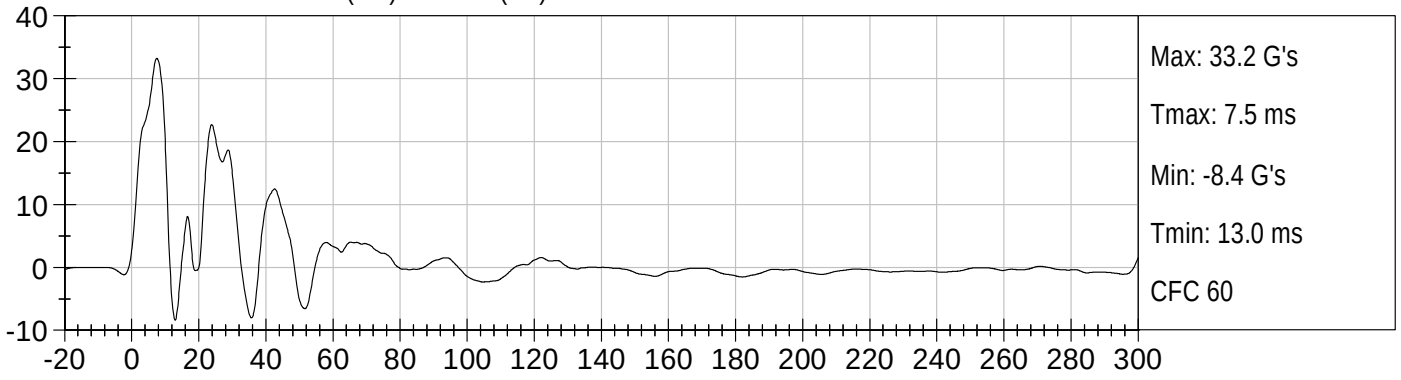

VEHICLE CG Y Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 21.3 kph
Tmax: 81.9 ms
Min: -0.0 kph
Tmin: 1.3 ms
CFC 180


VEHICLE CG Z Velocity (kph) vs TIME (ms)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 2.7 kph
Tmax: 300.0 ms
Min: -0.7 kph
Tmin: 5.5 ms
CFC 180

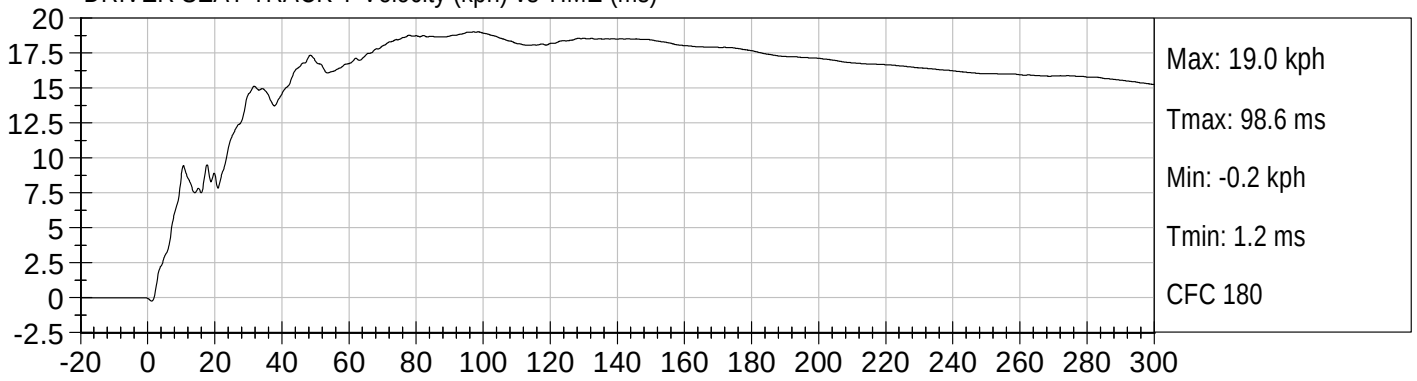
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

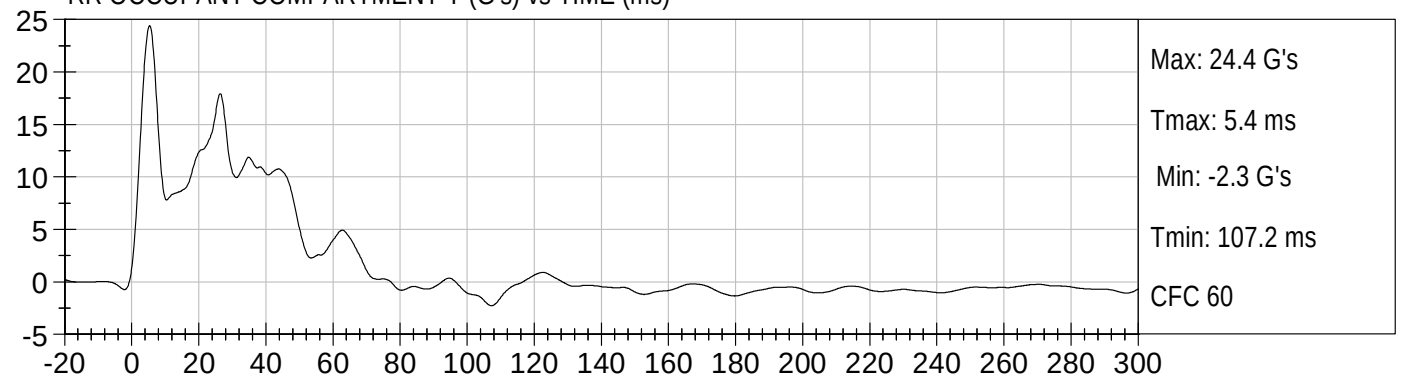
DRIVER SEAT TRACK Y (G's) vs TIME (ms)



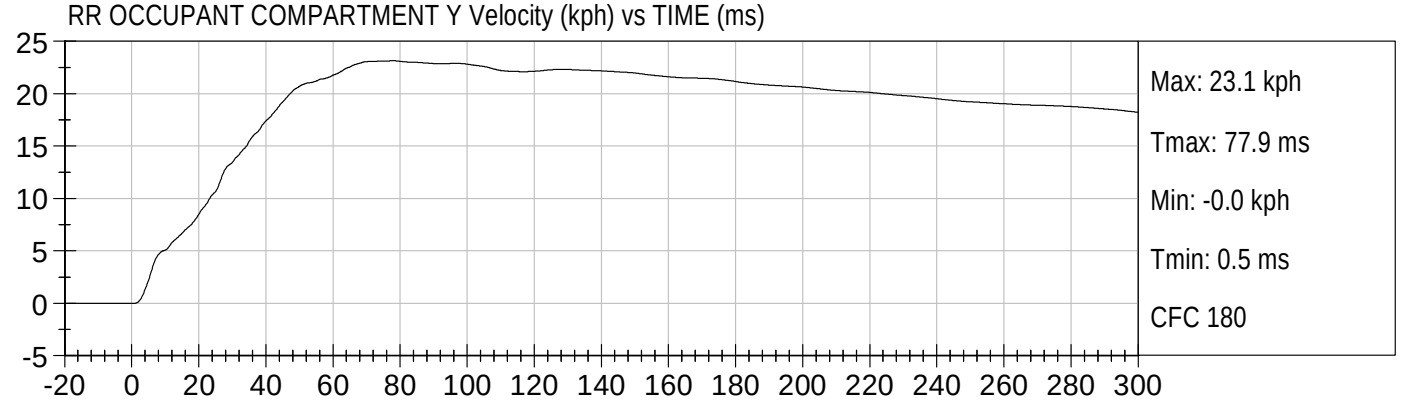
DRIVER SEAT TRACK Y Velocity (kph) vs TIME (ms)



RR OCCUPANT COMPARTMENT Y (G's) vs TIME (ms)



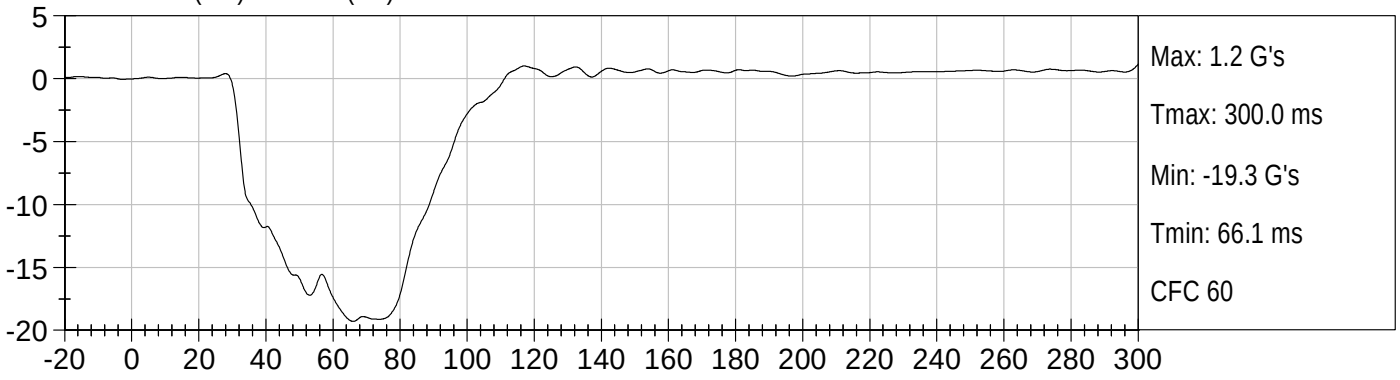
RR OCCUPANT COMPARTMENT Y Velocity (kph) vs TIME (ms)



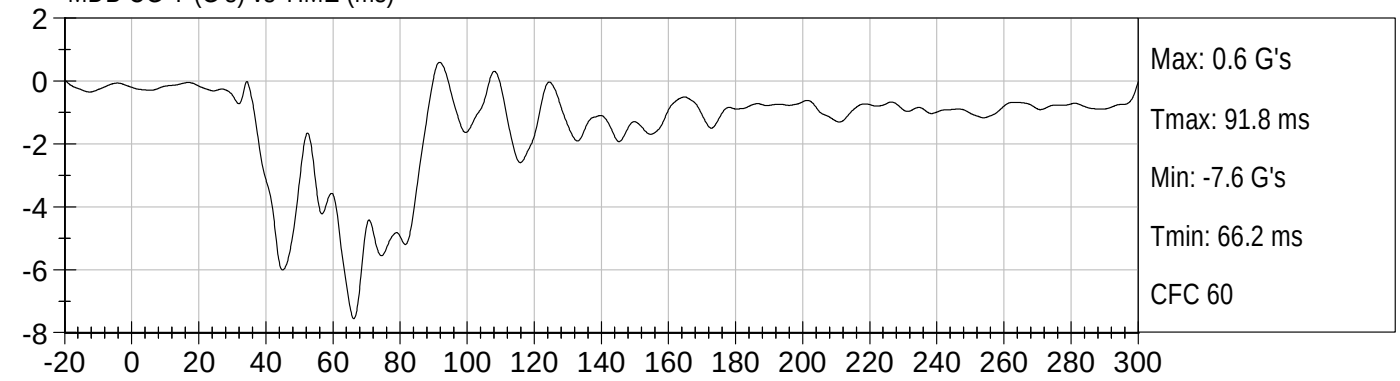
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

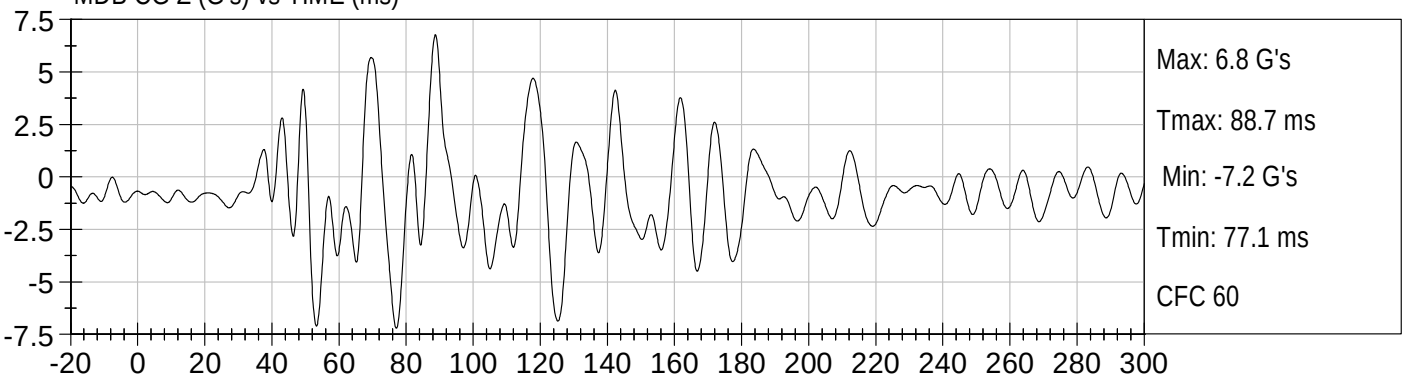
MDB CG X (G's) vs TIME (ms)



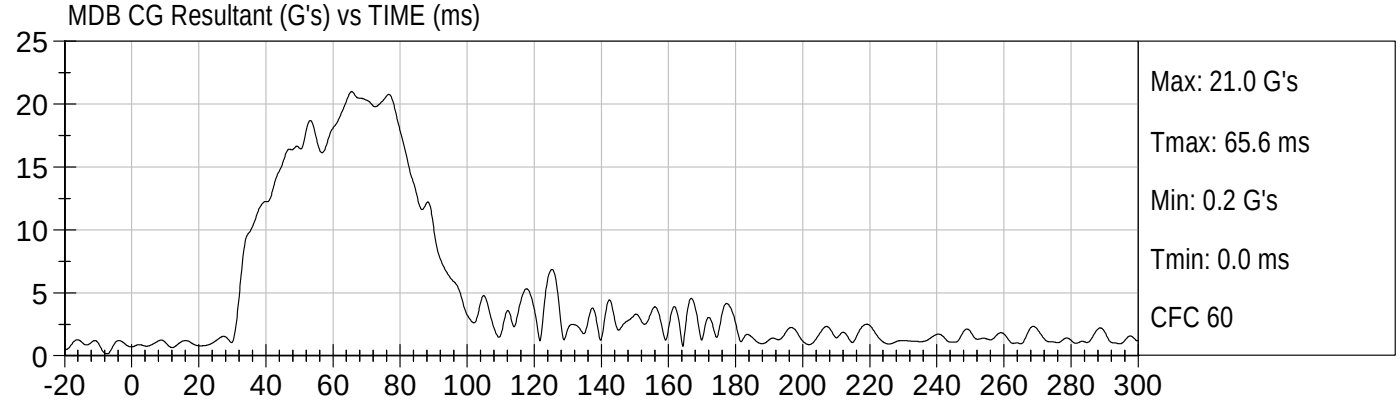
MDB CG Y (G's) vs TIME (ms)



MDB CG Z (G's) vs TIME (ms)



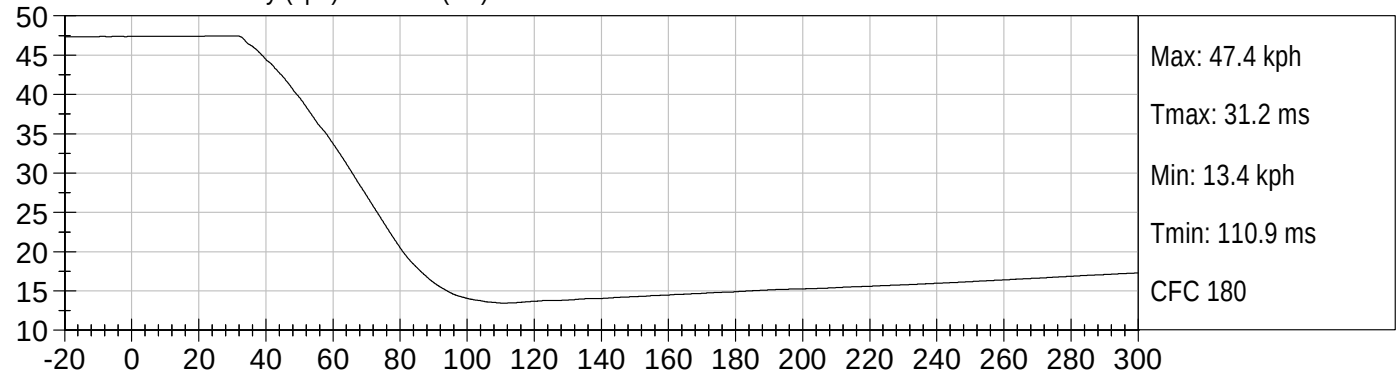
MDB CG Resultant (G's) vs TIME (ms)



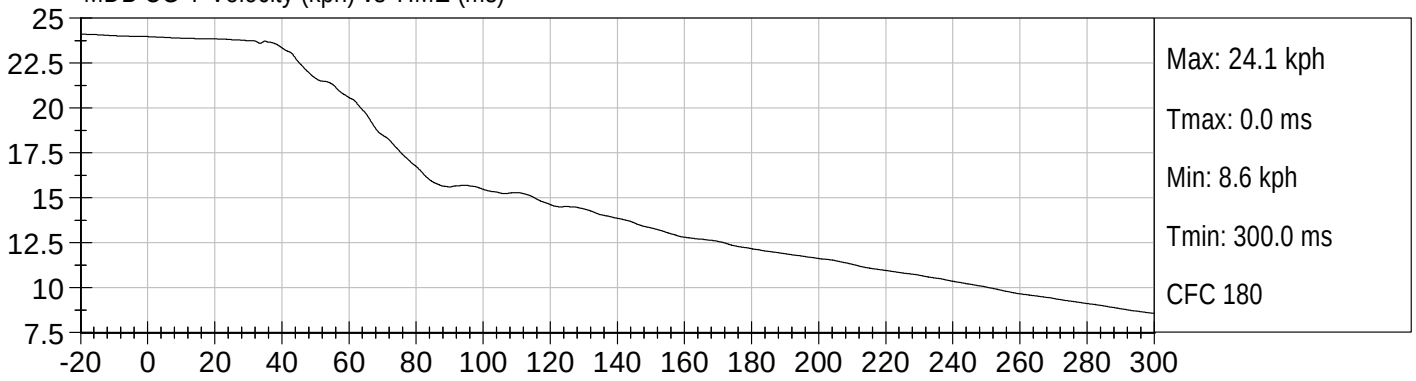
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

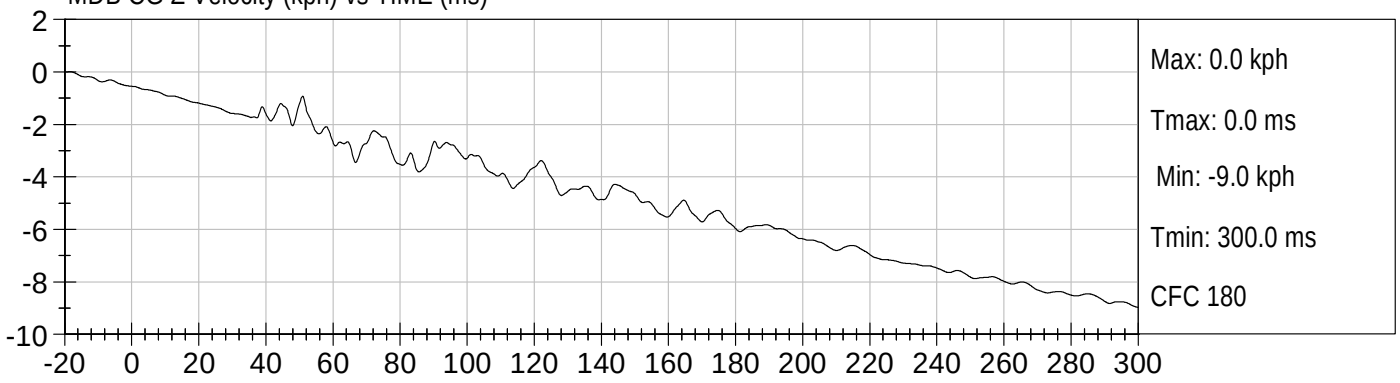
MDB CG X Velocity (kph) vs TIME (ms)



MDB CG Y Velocity (kph) vs TIME (ms)

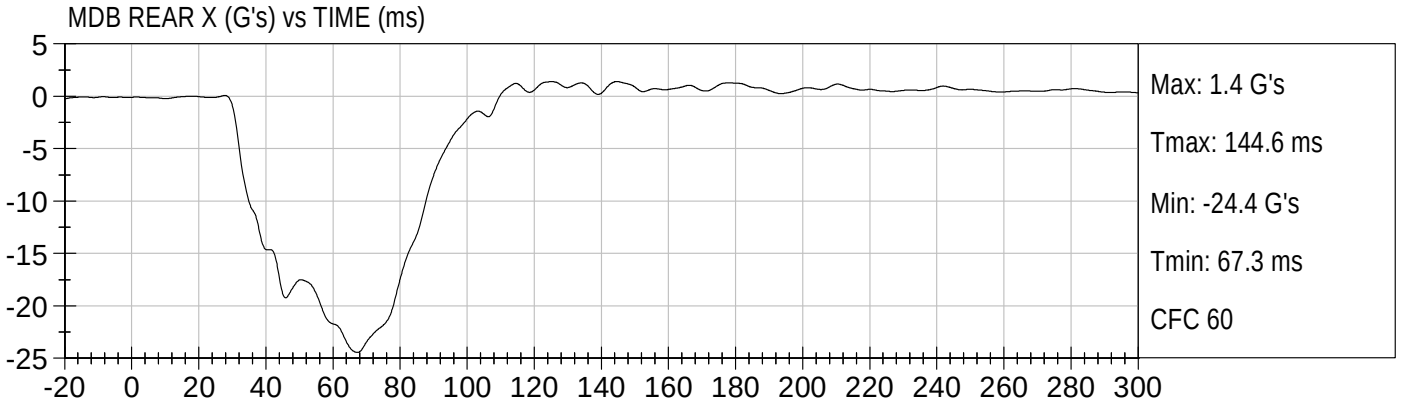


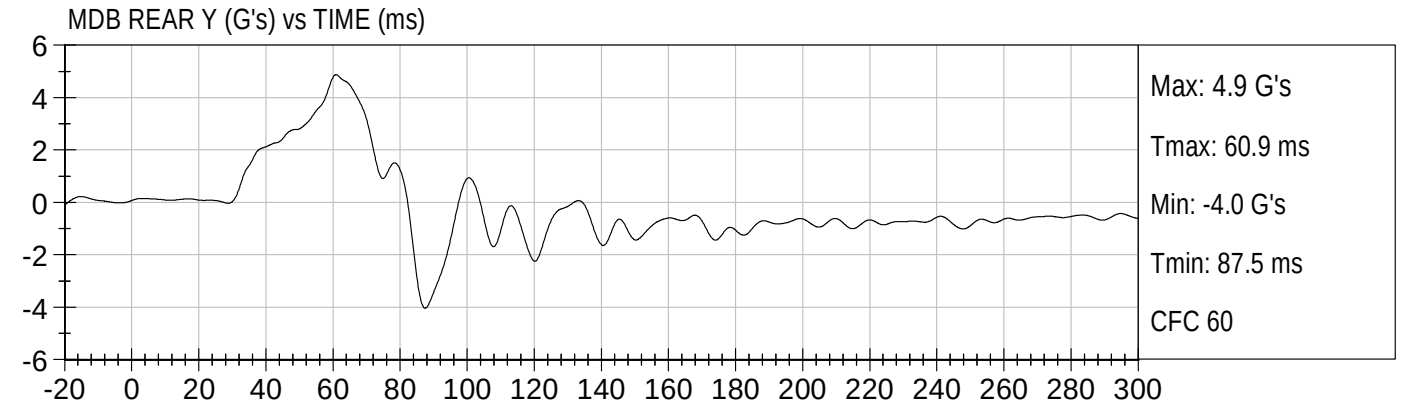
MDB CG Z Velocity (kph) vs TIME (ms)

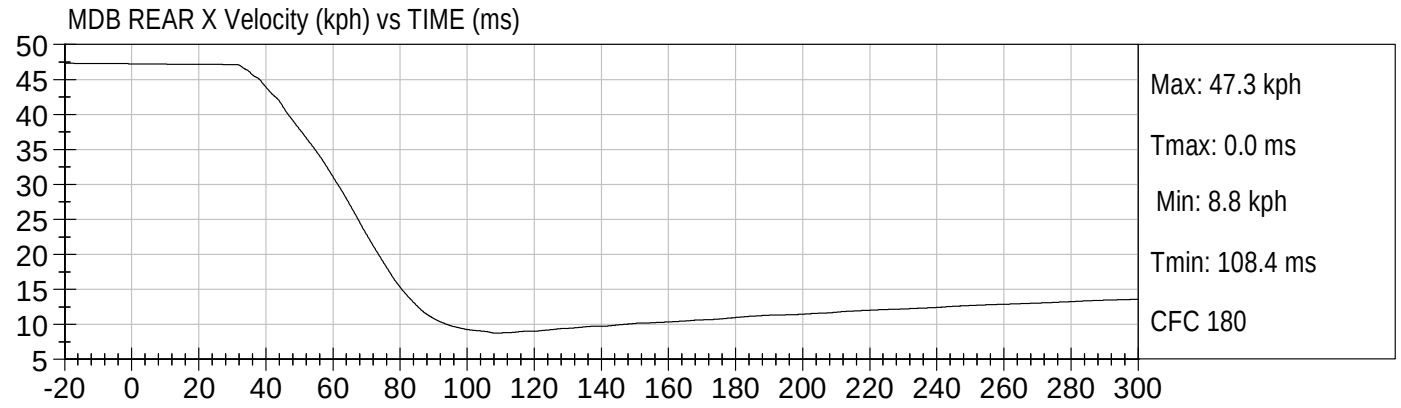


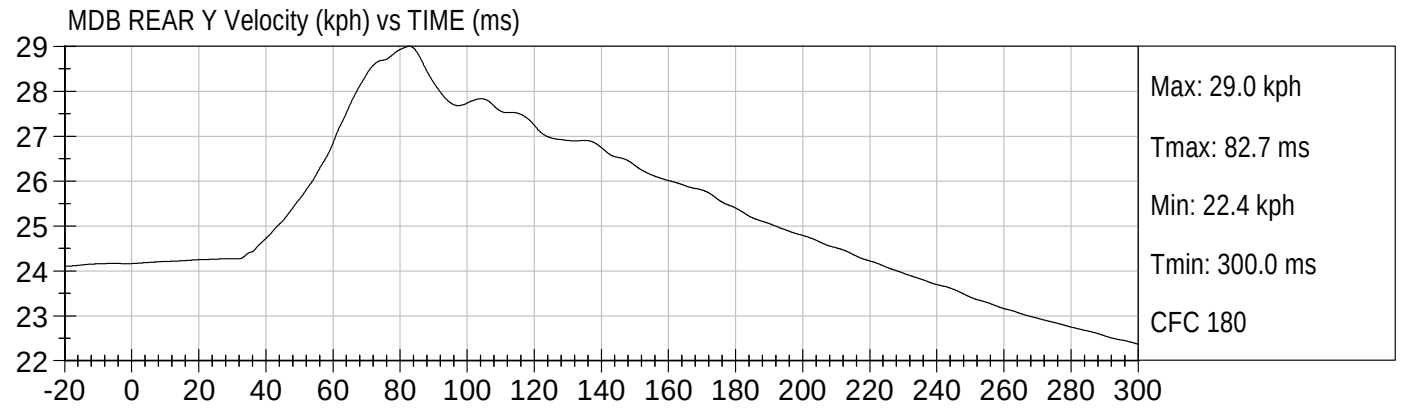
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)



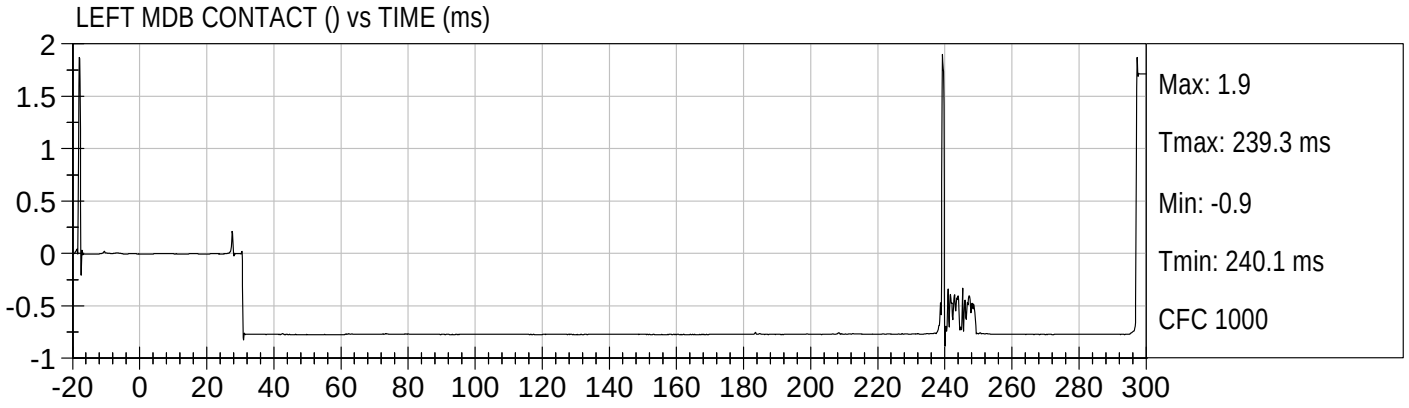


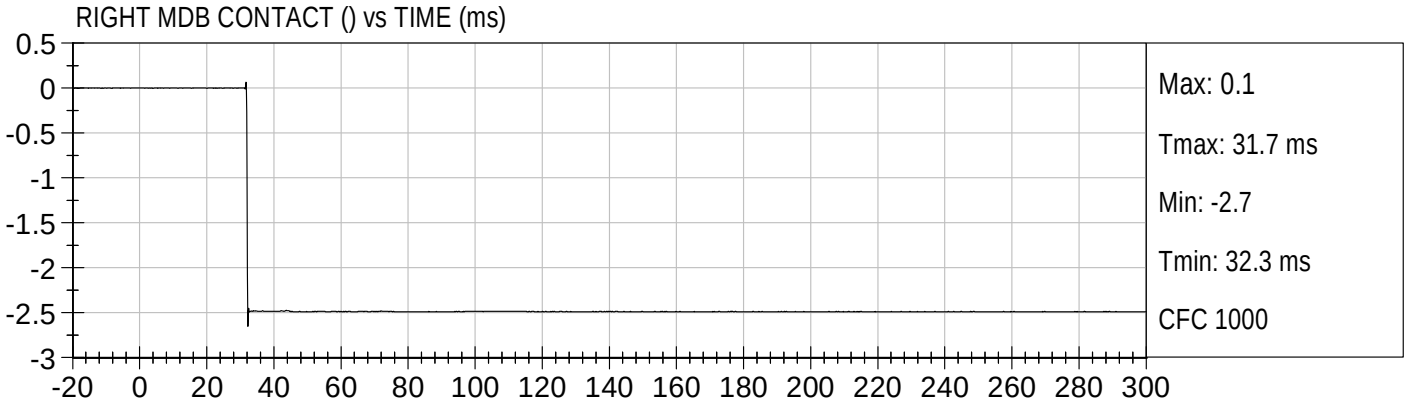




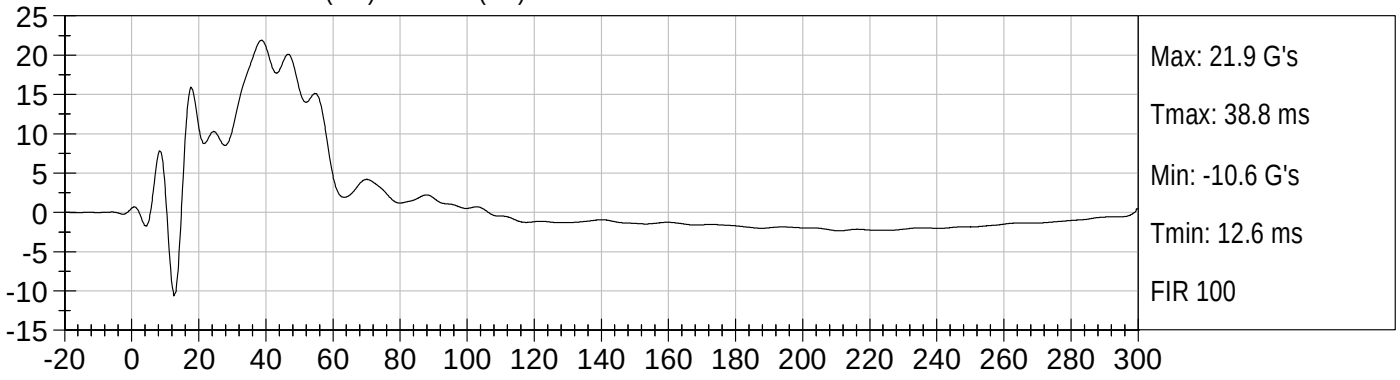
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

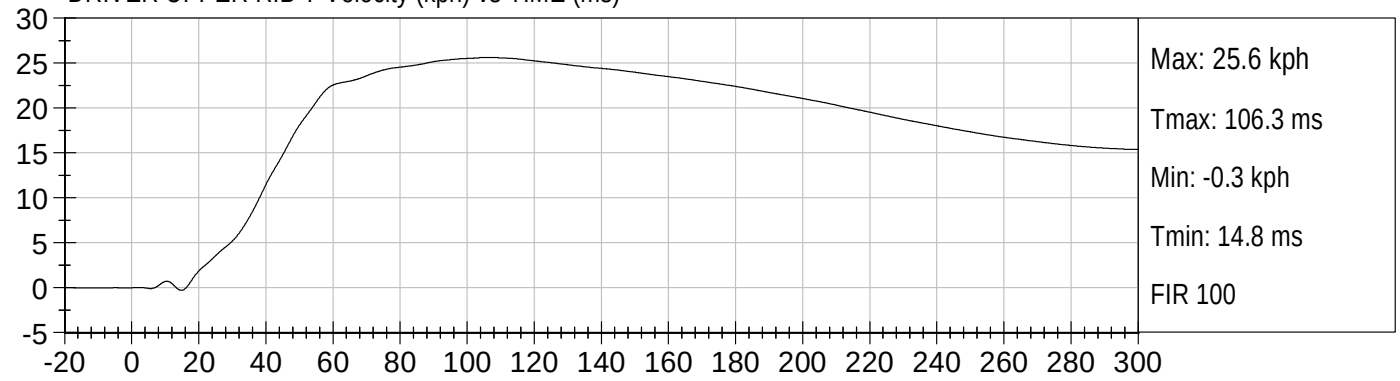




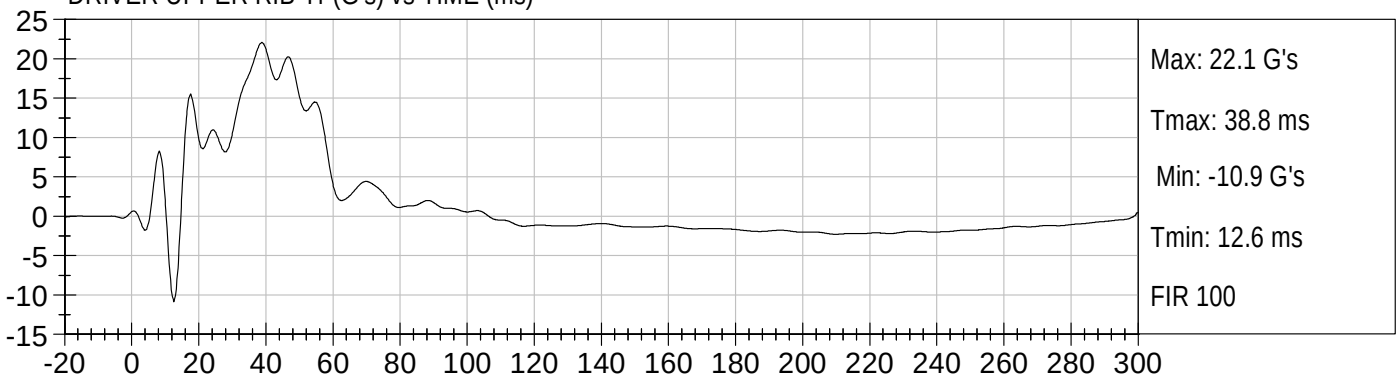
DRIVER UPPER RIB Y (G's) vs TIME (ms)



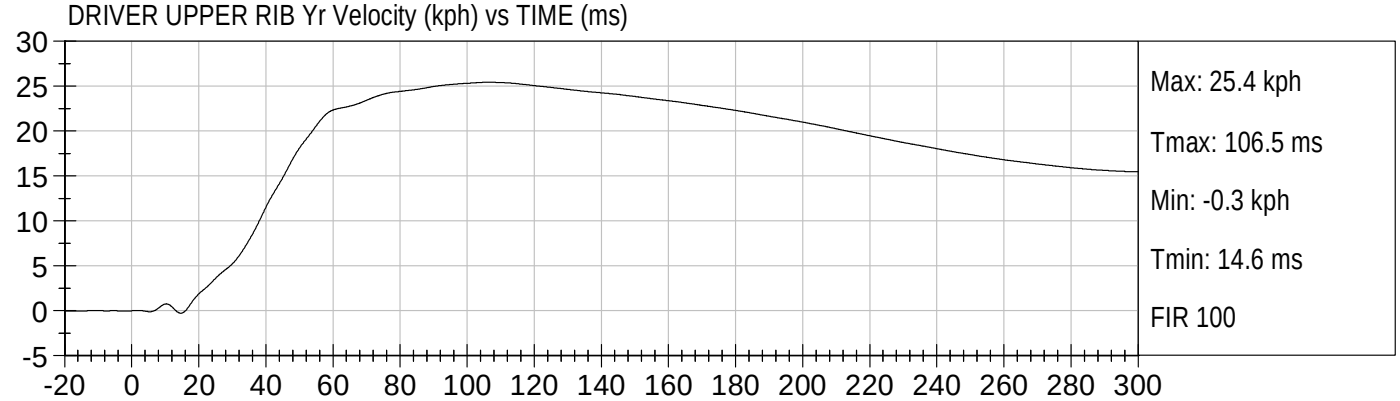
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)



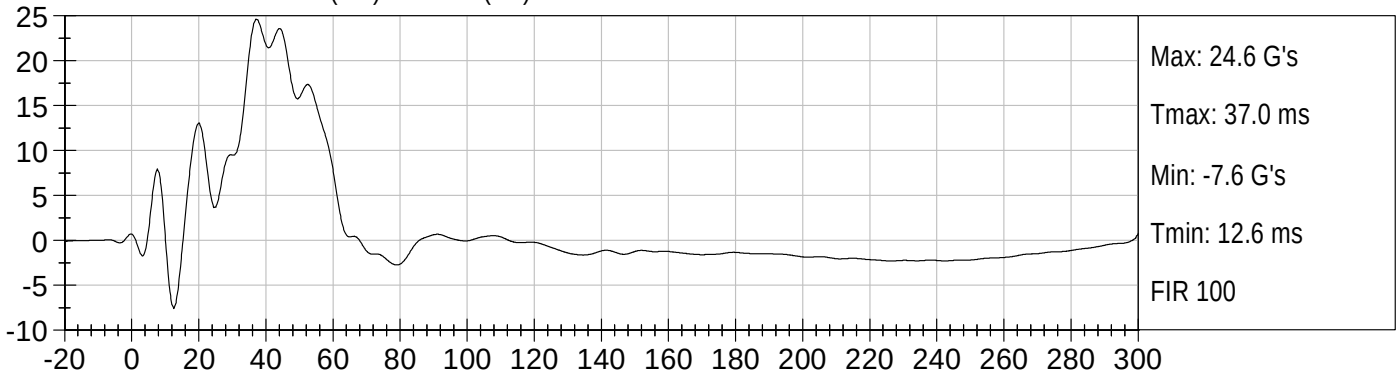
DRIVER UPPER RIB Yr (G's) vs TIME (ms)



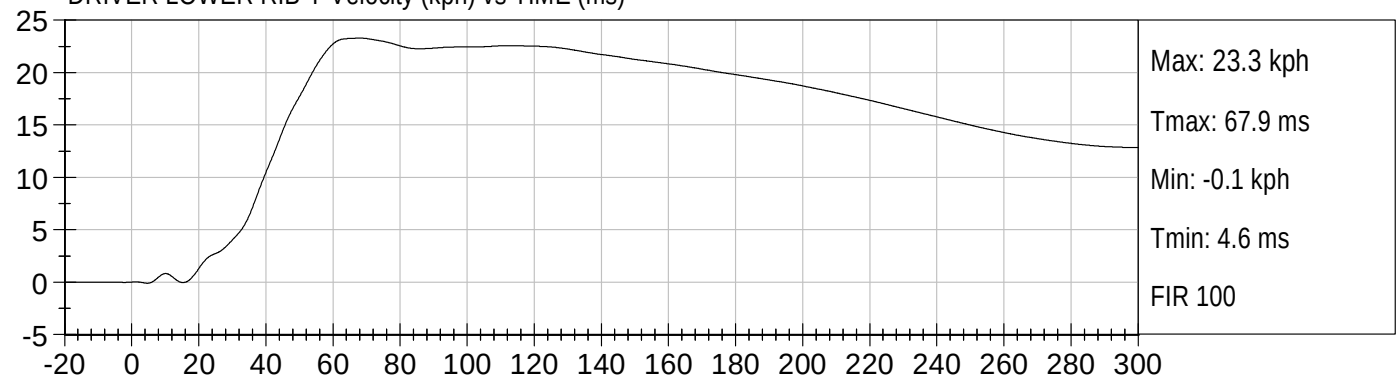
DRIVER UPPER RIB Yr Velocity (kph) vs TIME (ms)



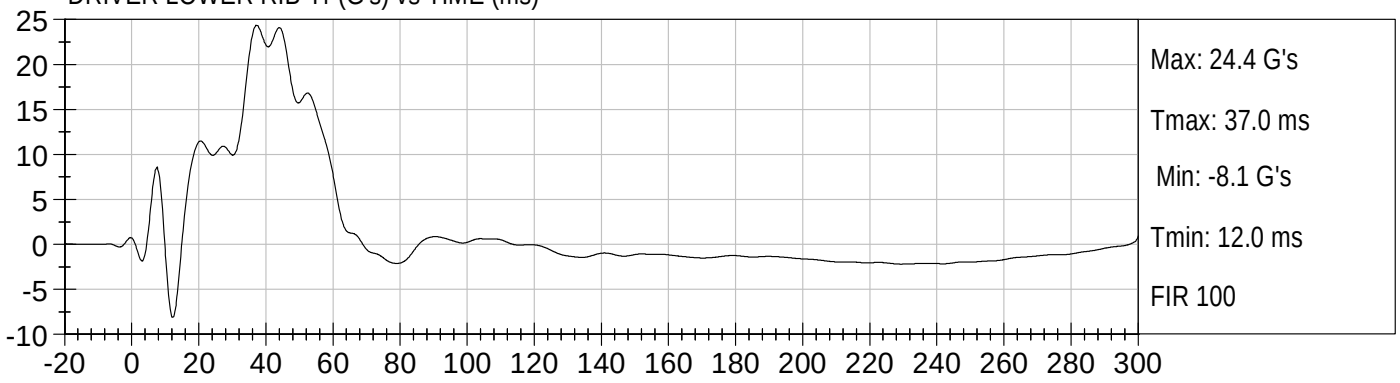
DRIVER LOWER RIB Y (G's) vs TIME (ms)



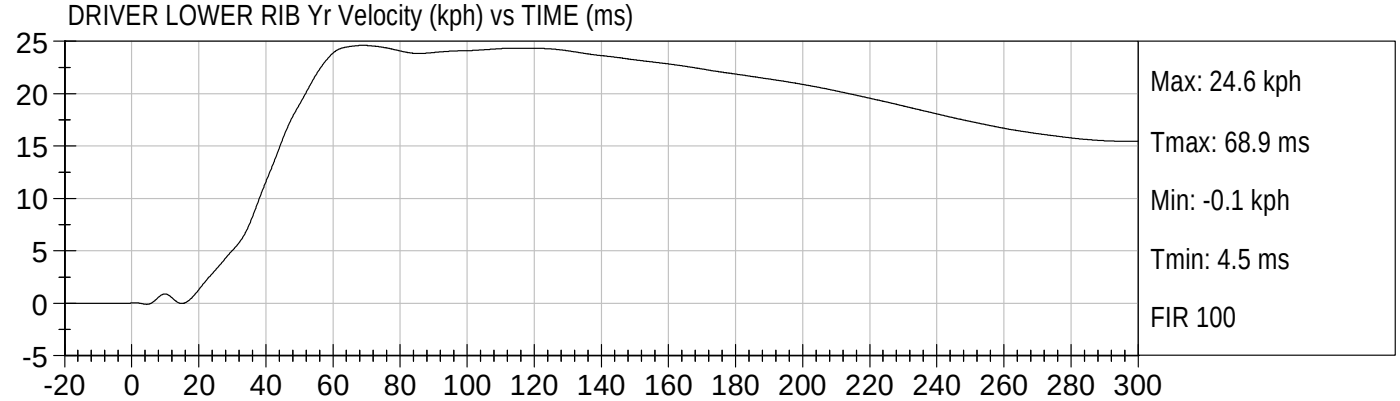
DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)



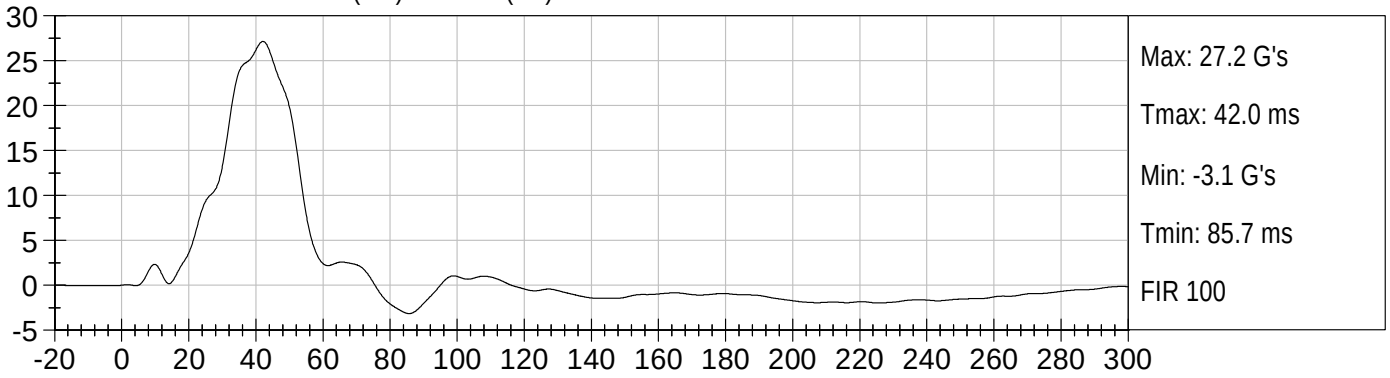
DRIVER LOWER RIB Yr (G's) vs TIME (ms)



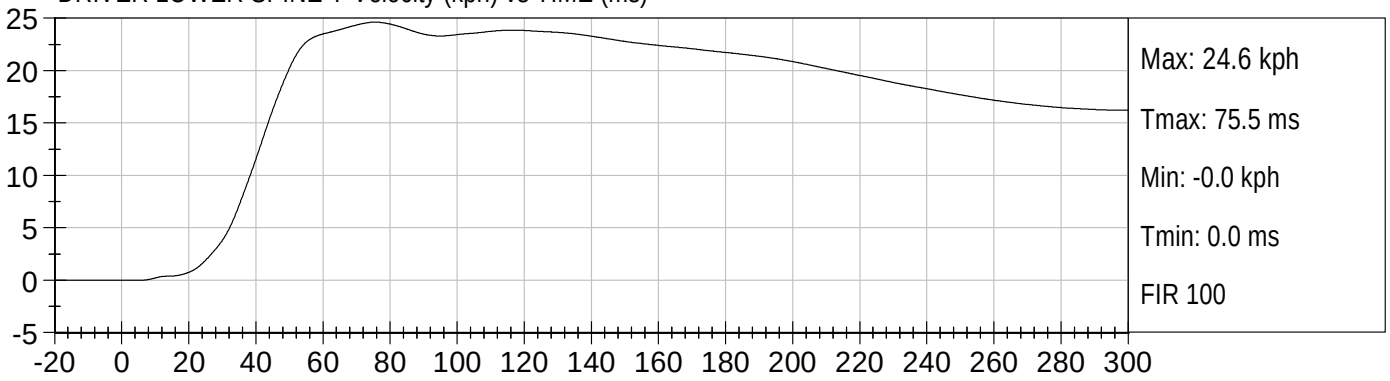
DRIVER LOWER RIB Yr Velocity (kph) vs TIME (ms)



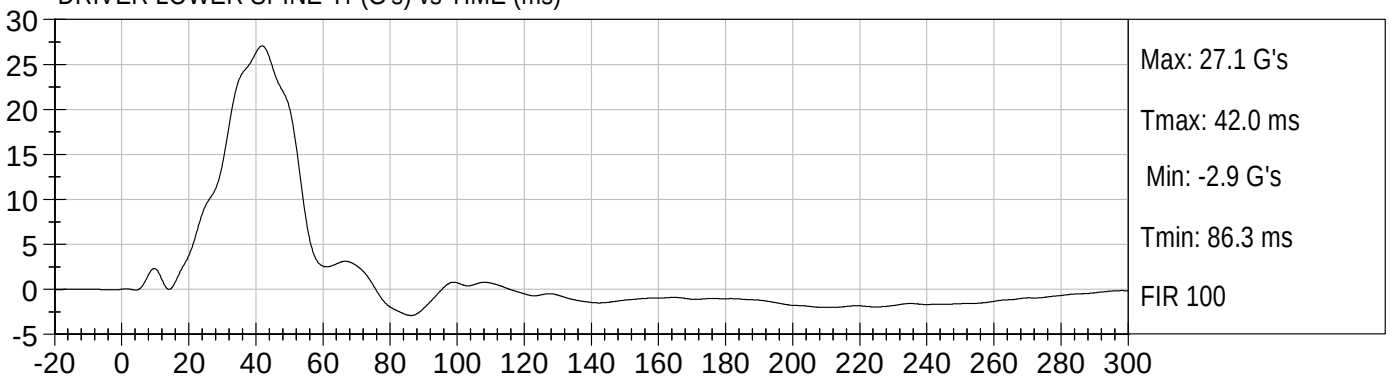
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



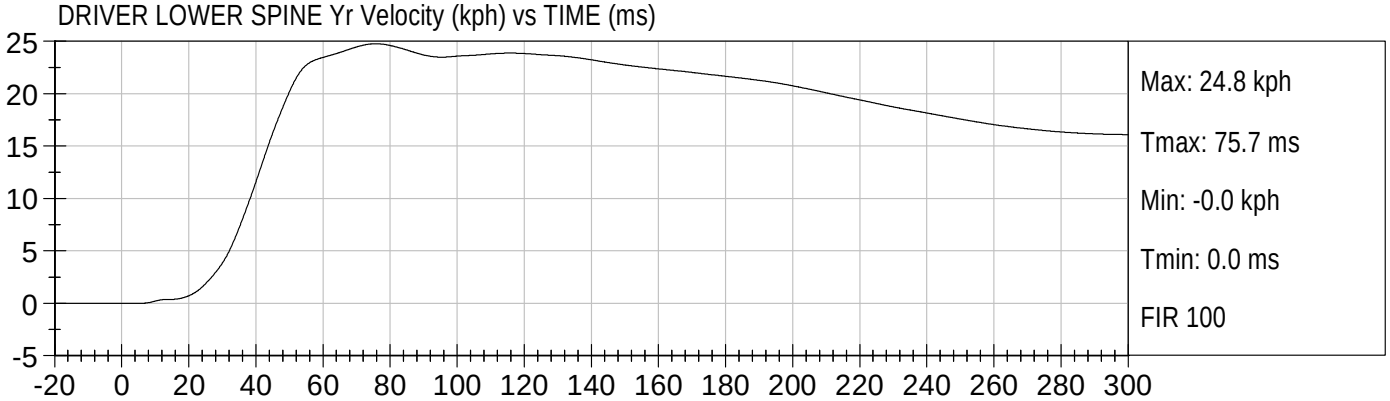
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)



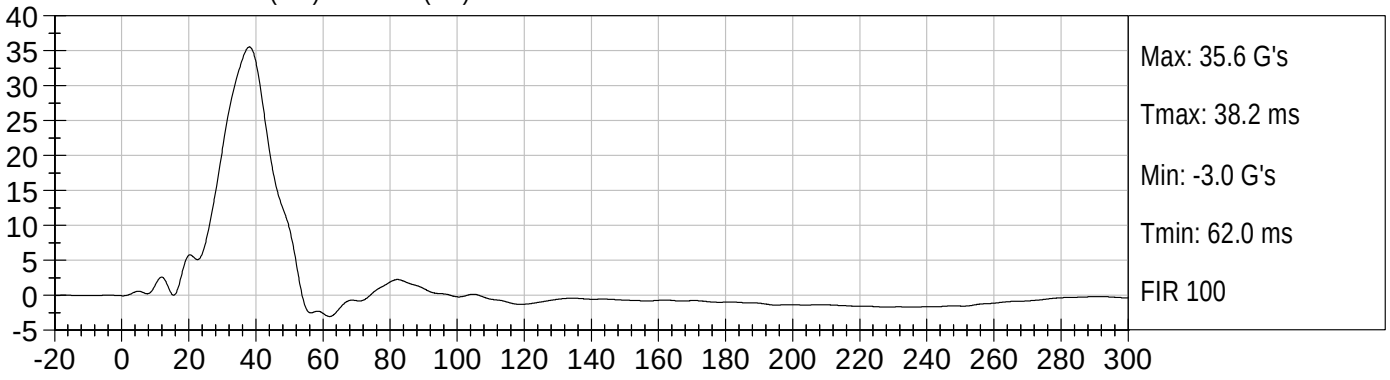
DRIVER LOWER SPINE Yr (G's) vs TIME (ms)



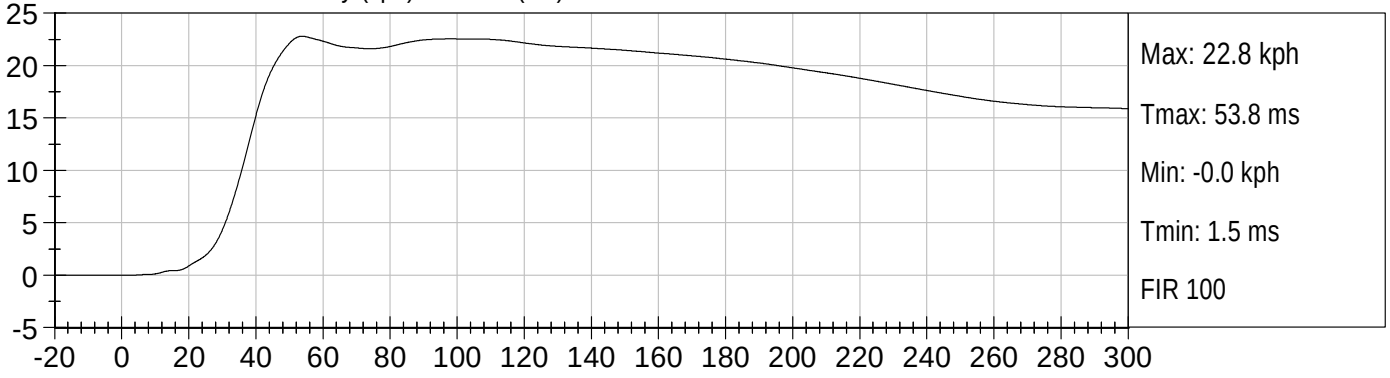
DRIVER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



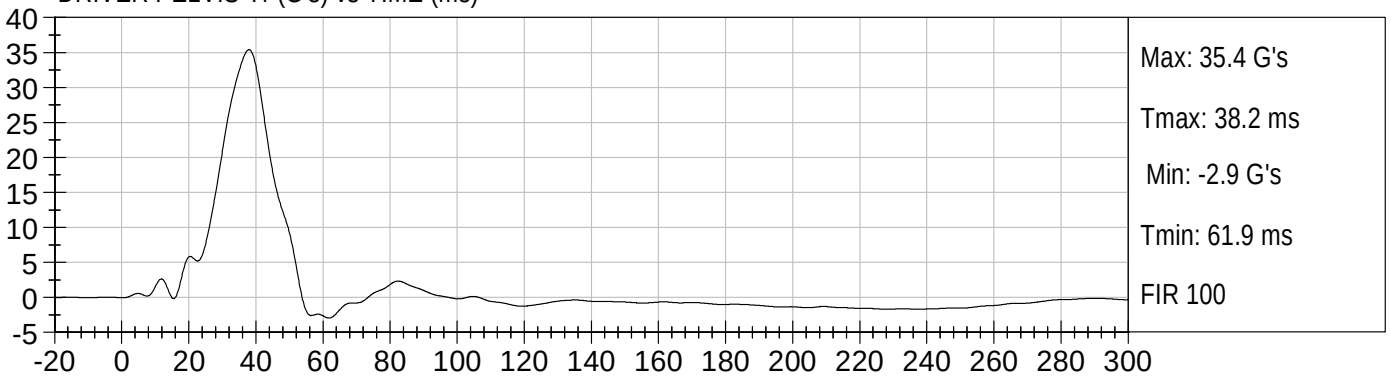
DRIVER PELVIS Y (G's) vs TIME (ms)



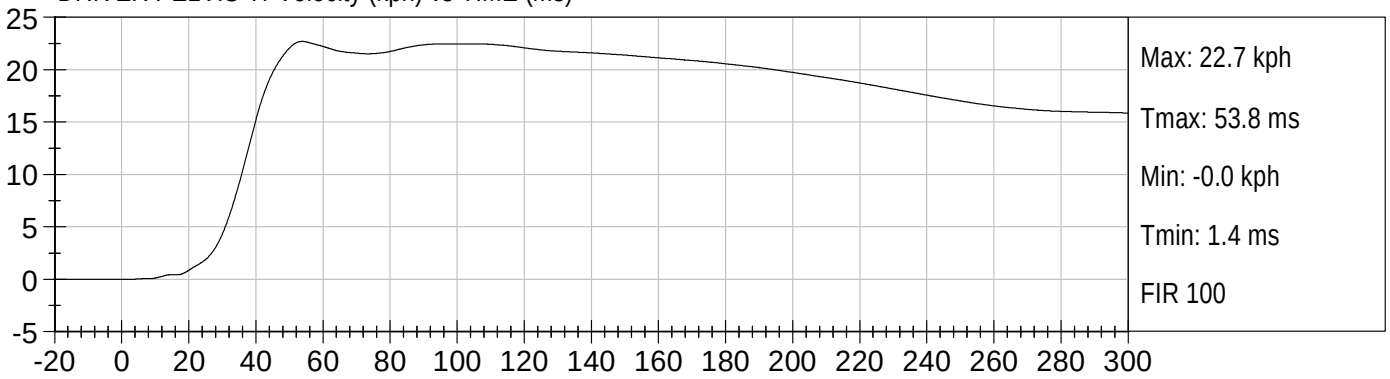
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)



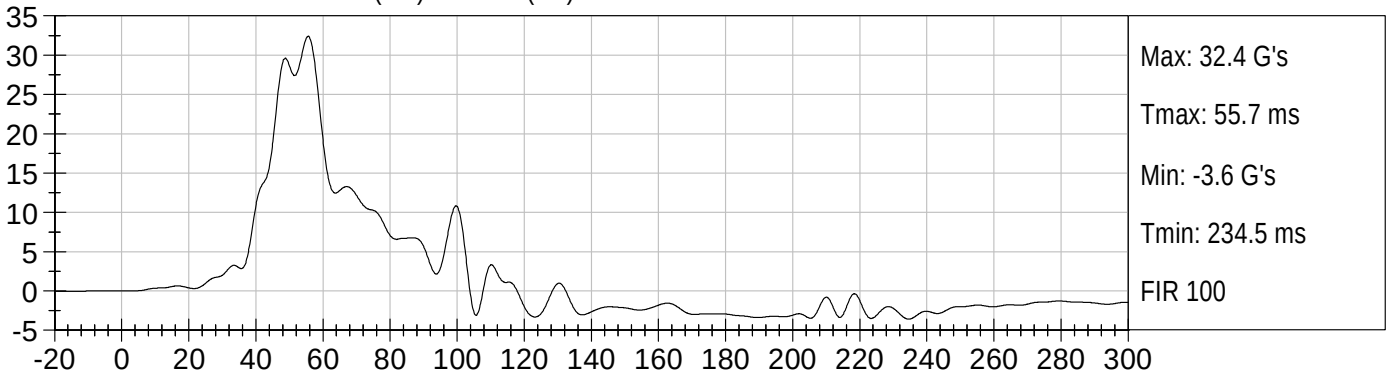
DRIVER PELVIS Yr (G's) vs TIME (ms)



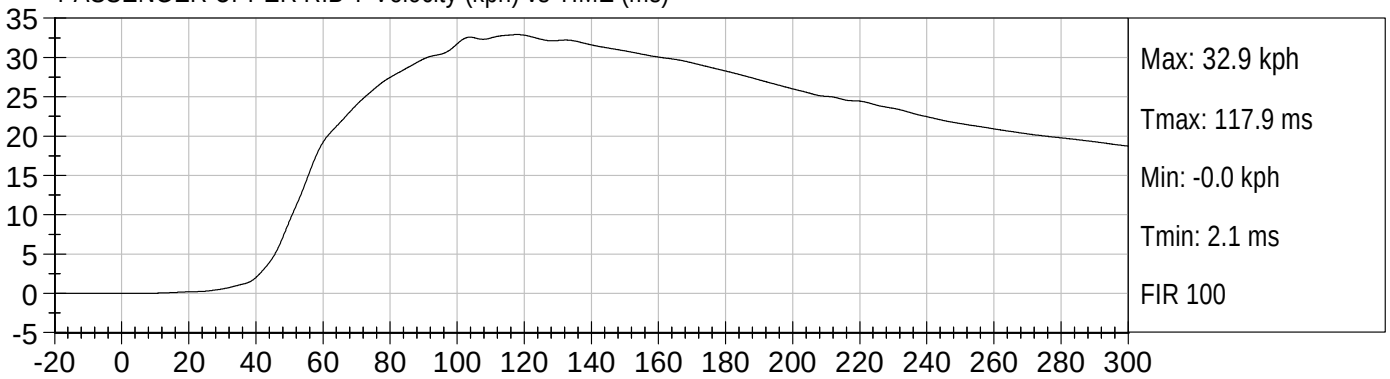
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)



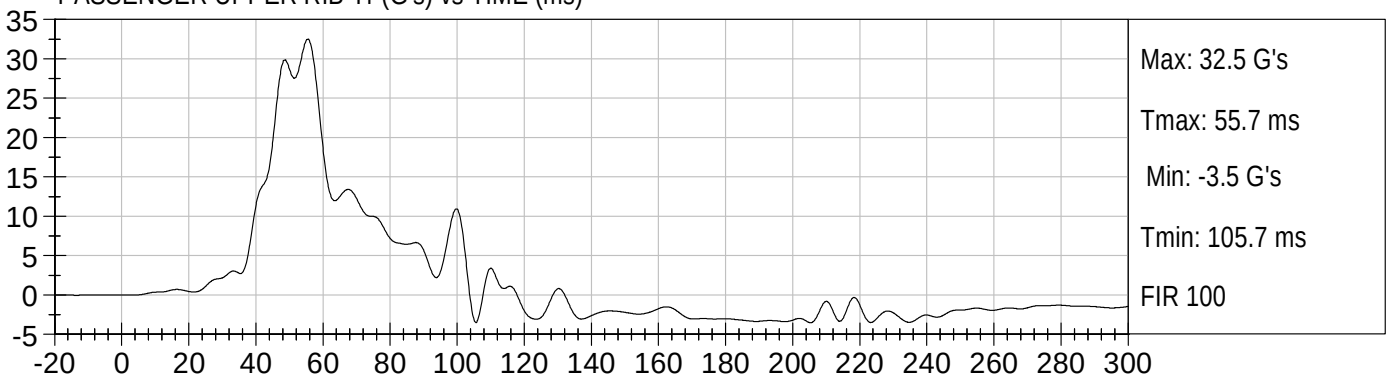
PASSENGER UPPER RIB Y (G's) vs TIME (ms)



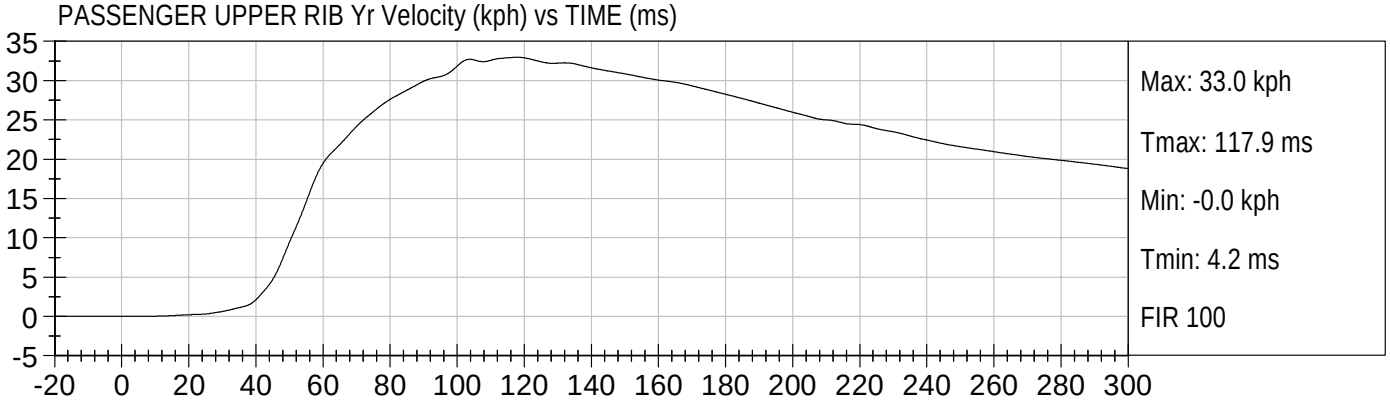
PASSENGER UPPER RIB Y Velocity (kph) vs TIME (ms)



PASSENGER UPPER RIB Yr (G's) vs TIME (ms)



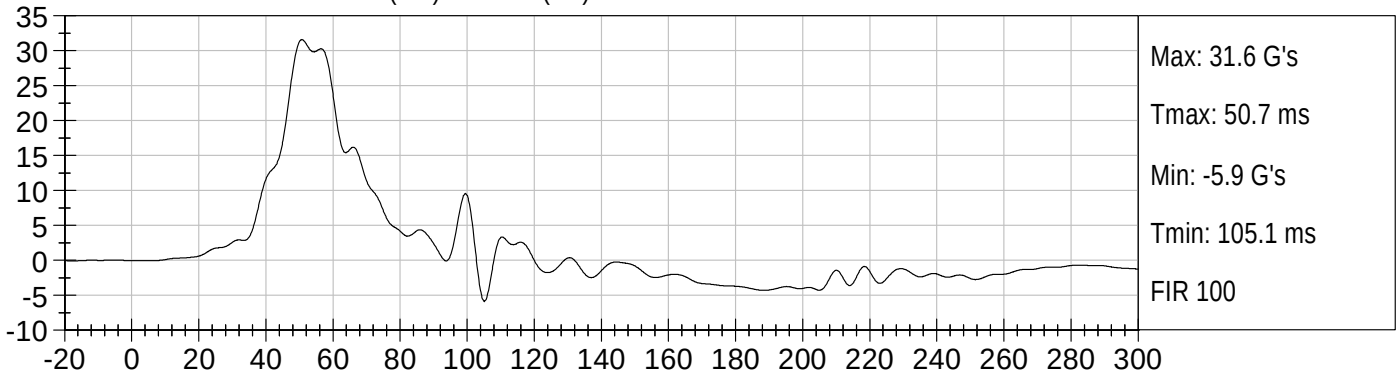
PASSENGER UPPER RIB Yr Velocity (kph) vs TIME (ms)



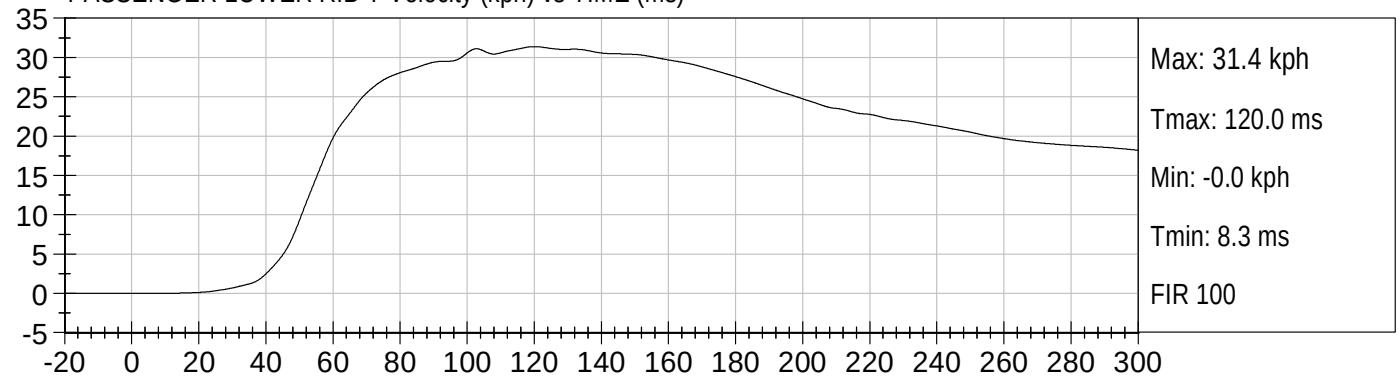
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

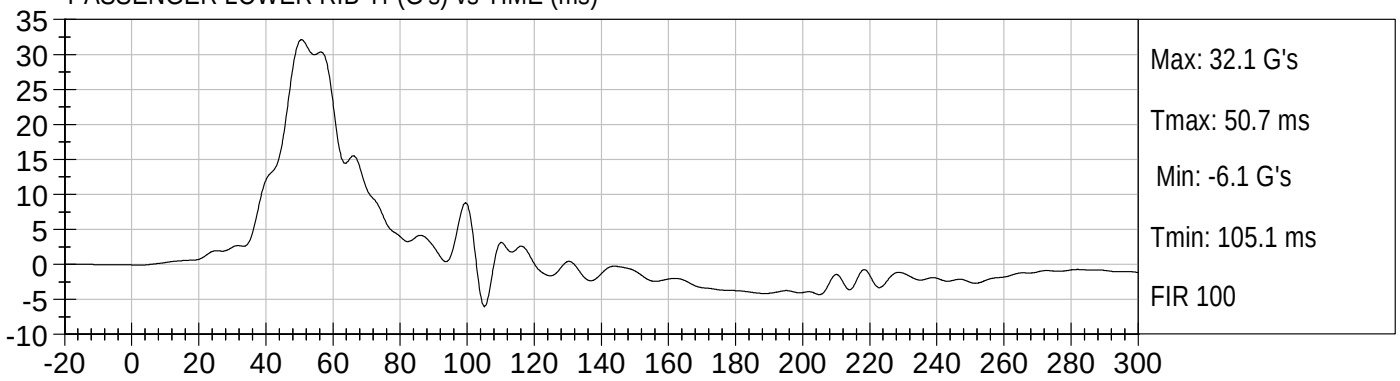
PASSENGER LOWER RIB Y (G's) vs TIME (ms)



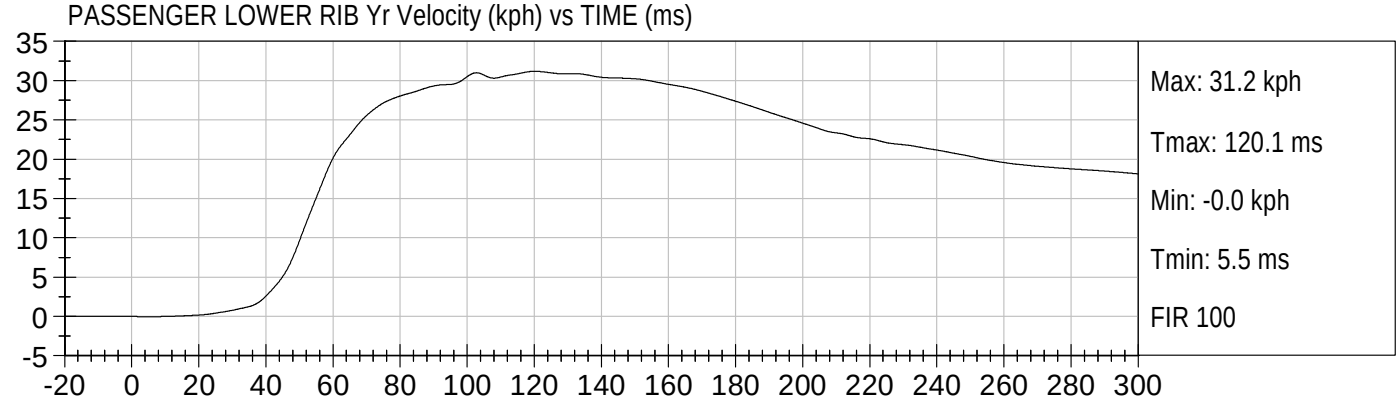
PASSENGER LOWER RIB Y Velocity (kph) vs TIME (ms)



PASSENGER LOWER RIB Yr (G's) vs TIME (ms)



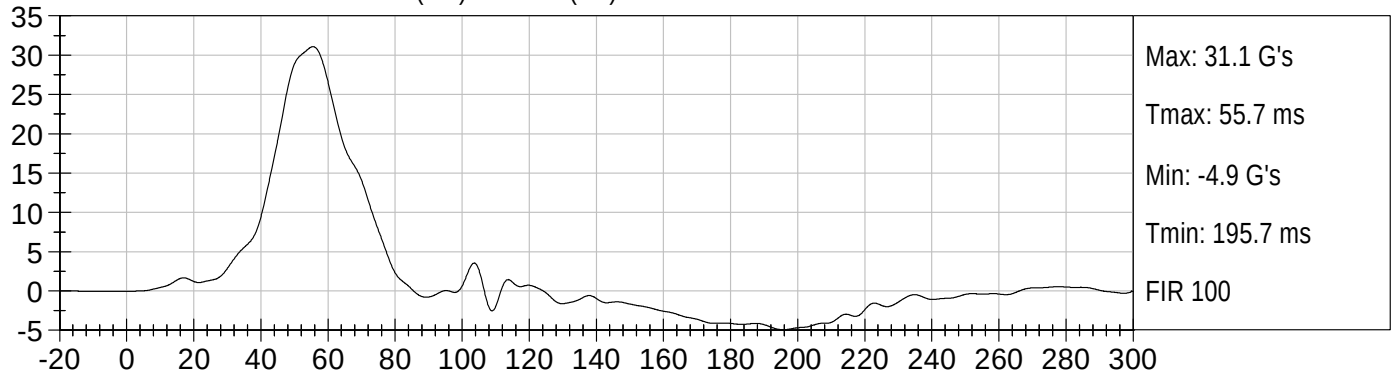
PASSENGER LOWER RIB Yr Velocity (kph) vs TIME (ms)



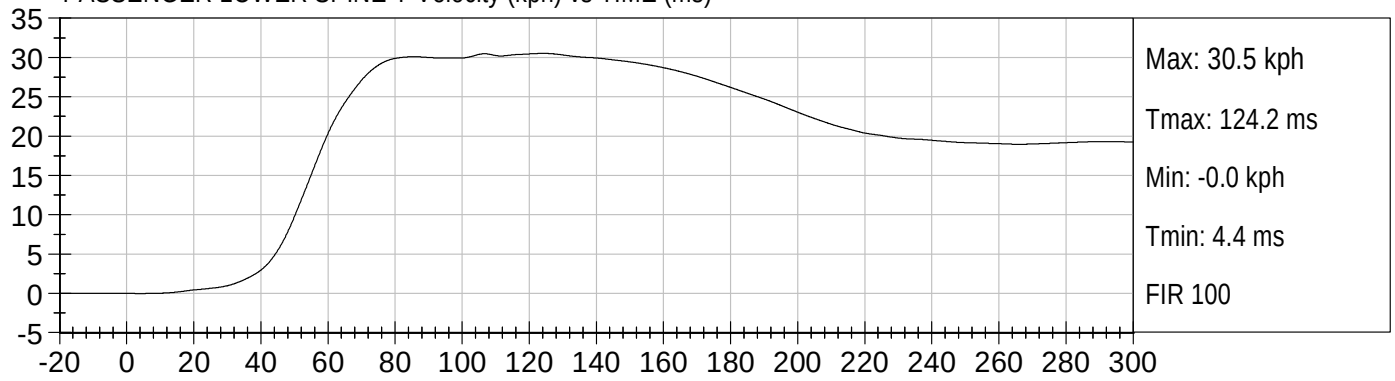
FMVSS 214 LEFT SIDE
2009 PONTIAC G8 C90109

Test Date: 03/24/2009
Speed: 33.0 mph (53.1 km/h)

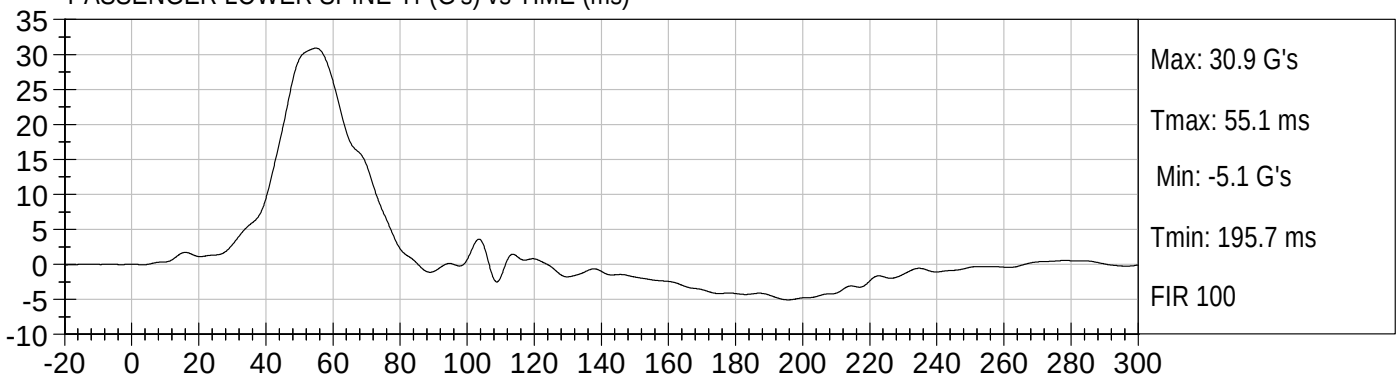
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



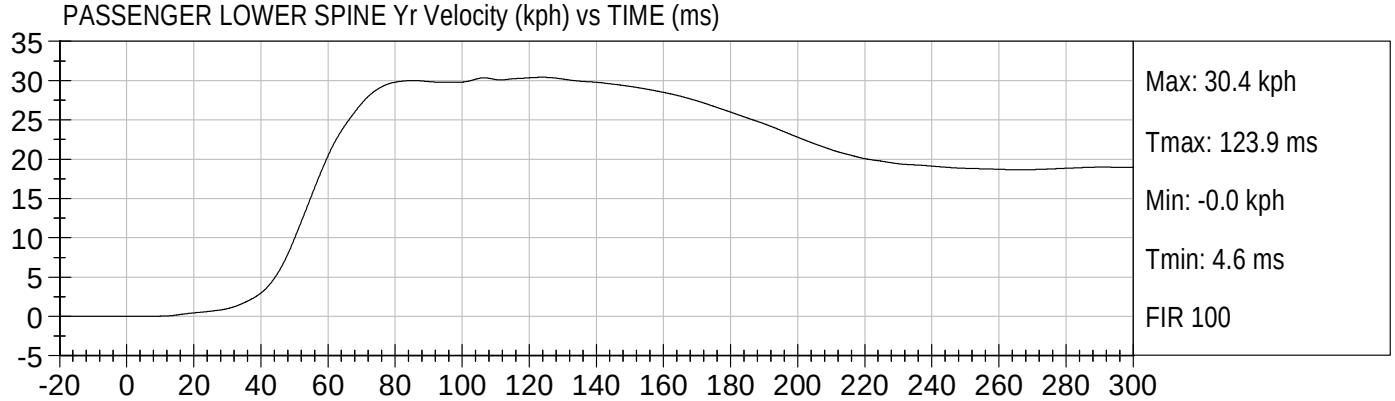
PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)



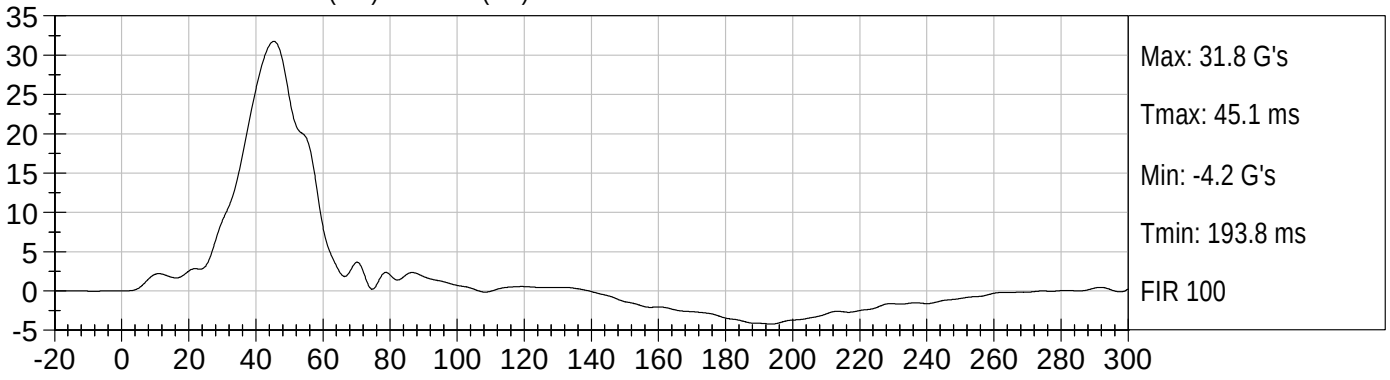
PASSENGER LOWER SPINE Yr (G's) vs TIME (ms)



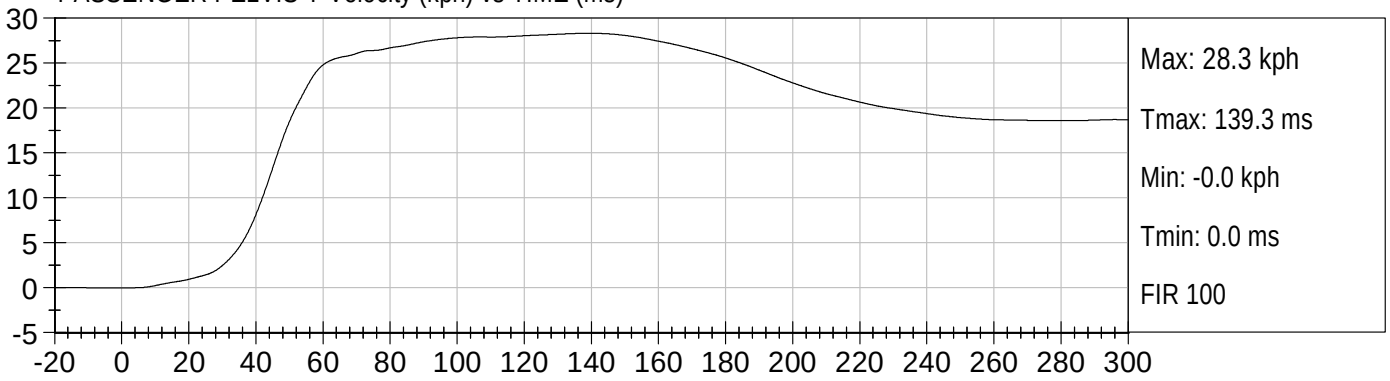
PASSENGER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



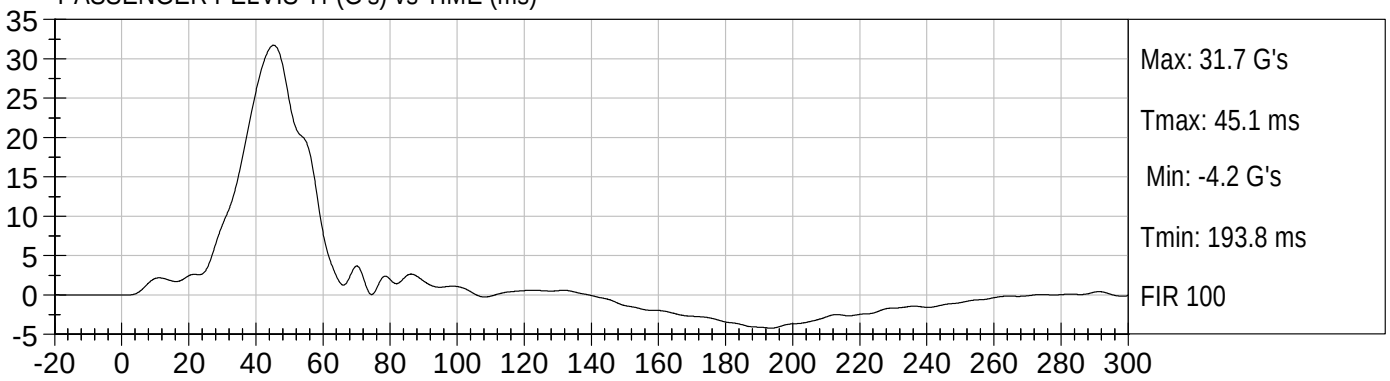
PASSENGER PELVIS Y (G's) vs TIME (ms)



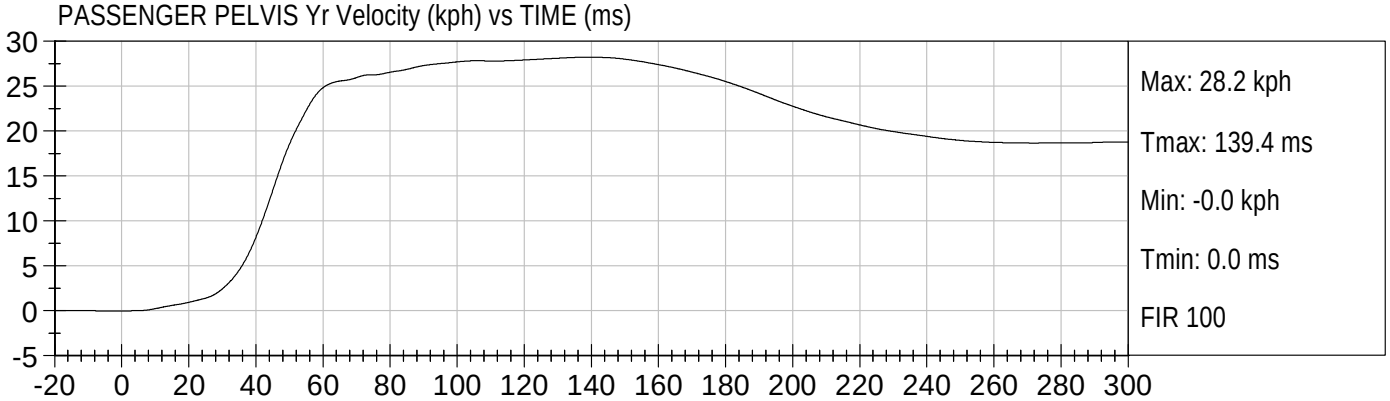
PASSENGER PELVIS Y Velocity (kph) vs TIME (ms)



PASSENGER PELVIS Yr (G's) vs TIME (ms)



PASSENGER PELVIS Yr Velocity (kph) vs TIME (ms)



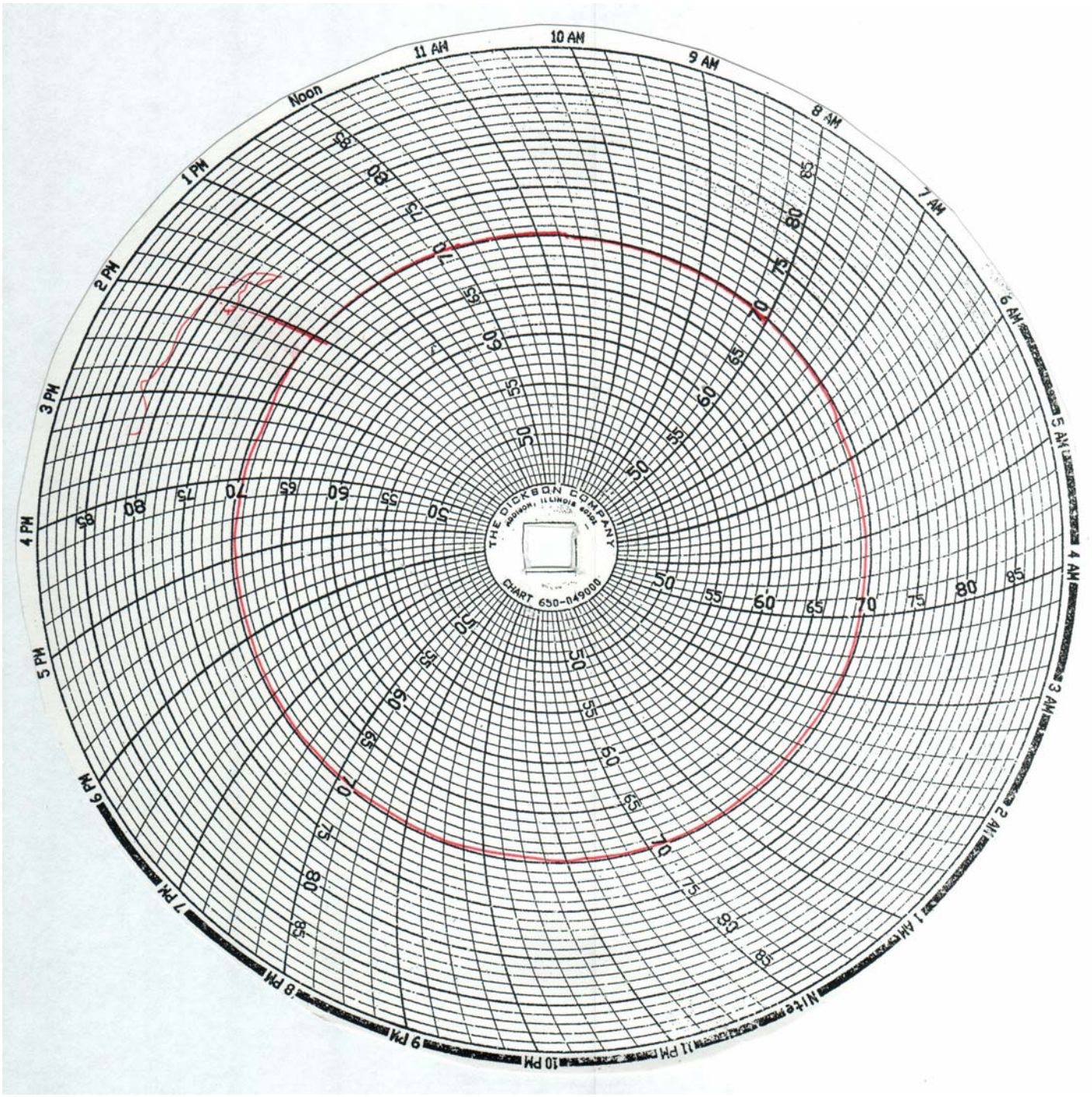
APPENDIX C

DUMMY CALIBRATION DATA

VEHICLE AND DUMMY TEMPERATURE

Test Vehicle:	2009 Pontiac G8 Sedan	NHTSA No.	C90109
Test Program:	FMVSS 214	Test Date:	3/24/2009

Test Time: 10:45 a.m.



CERTIFICATION DATA

Dummy Serial Number: 036

Calibration Test Results Summary

Dummy Serial Number: 036

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet

Side Impact Dummy

External Measurements

ATD Serial No: 036 **Test I.D:** D0955

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	893	Pass
RH - Rib Height	mm	501 - 521	517	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	238	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	524	Pass
SW - Knee Pivot to Floor	mm	490 - 505	493	Pass
HW - Hip Width	mm	356 - 391	373	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

3/18/2009
Test Date

David Winkelbauer
Approved By

SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 036 **Test I.D:** D09552

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	39	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	18	Pass
		Overall Test Results		Pass

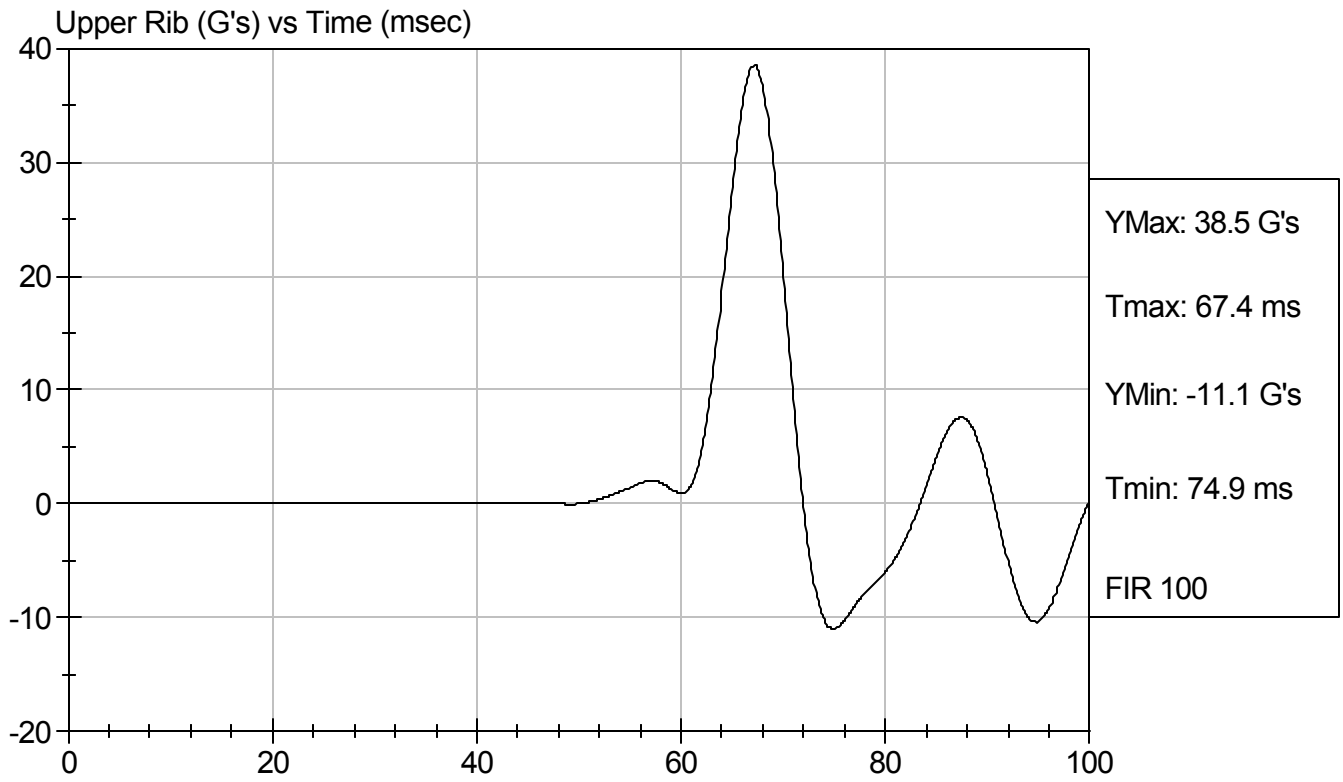
Jessica Hall
Laboratory Technician

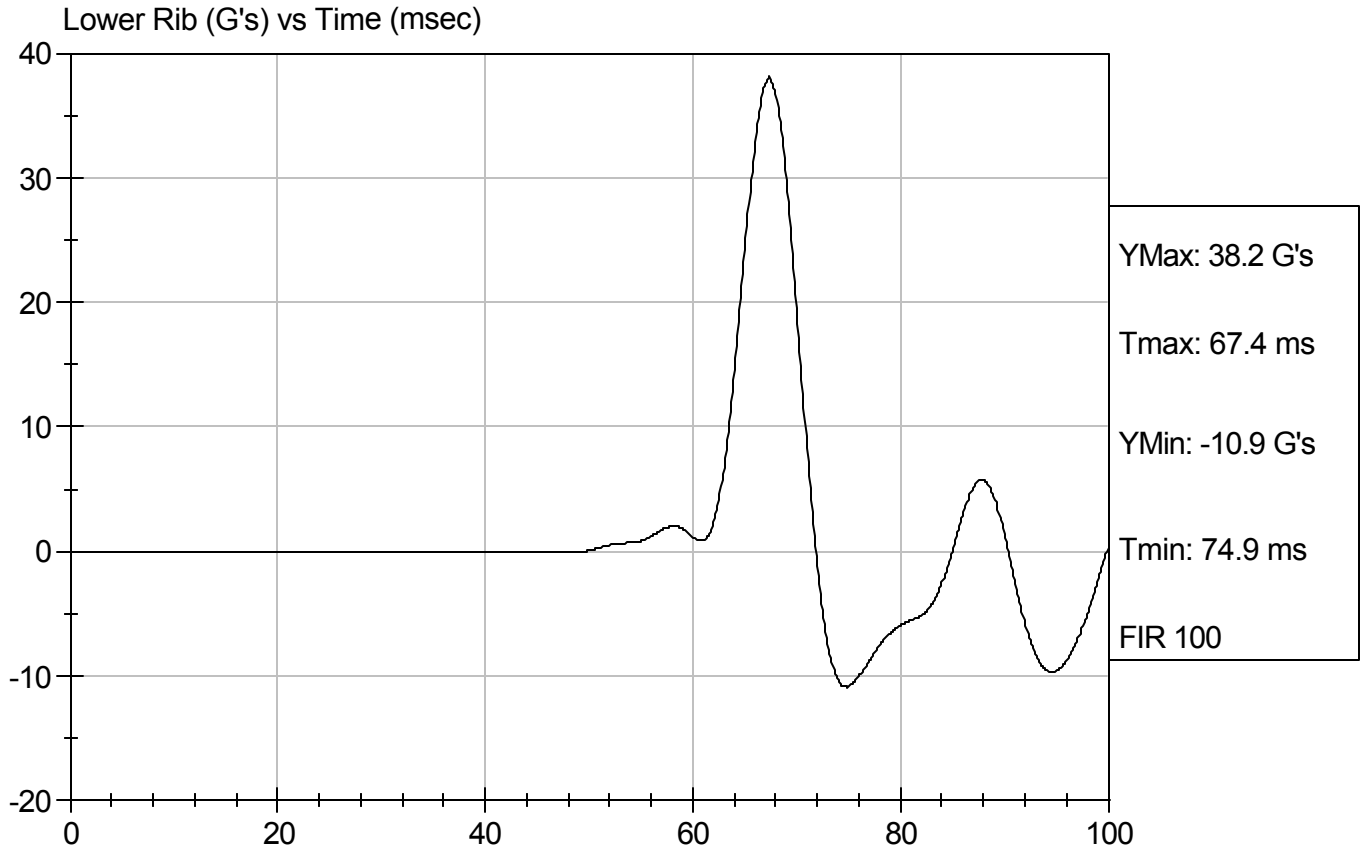
3/18/09
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D09552

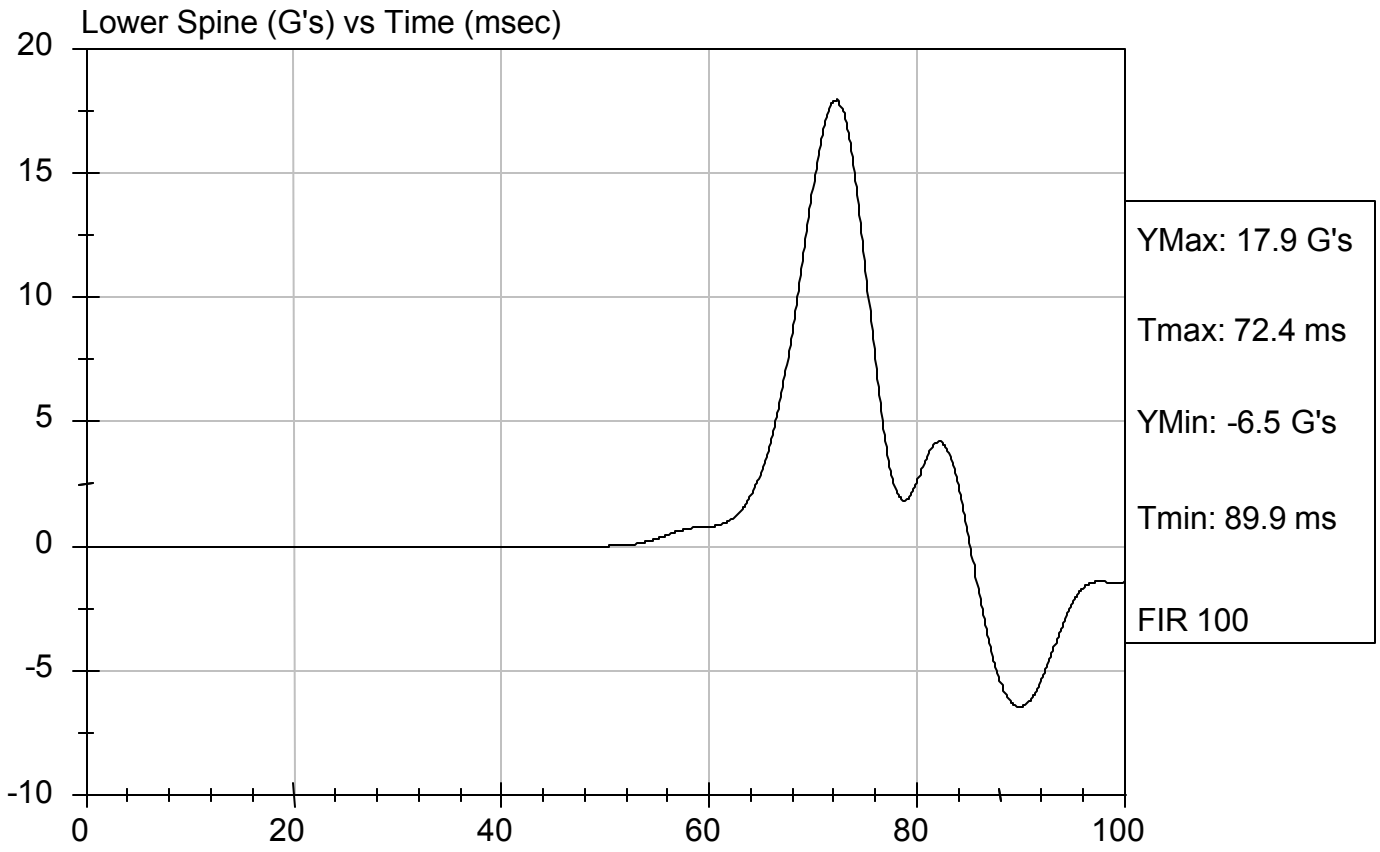
Test Date: 3/18/09
Speed: 13.89 ft/sec, 4.23 m/sec





Test Desc: Thorax Impact
Component ID: D09552

Test Date: 3/18/09
Speed: 13.89 ft/sec, 4.23 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 036 **Test I.D:** D09553

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	40	Pass
		Overall Test Results		Pass

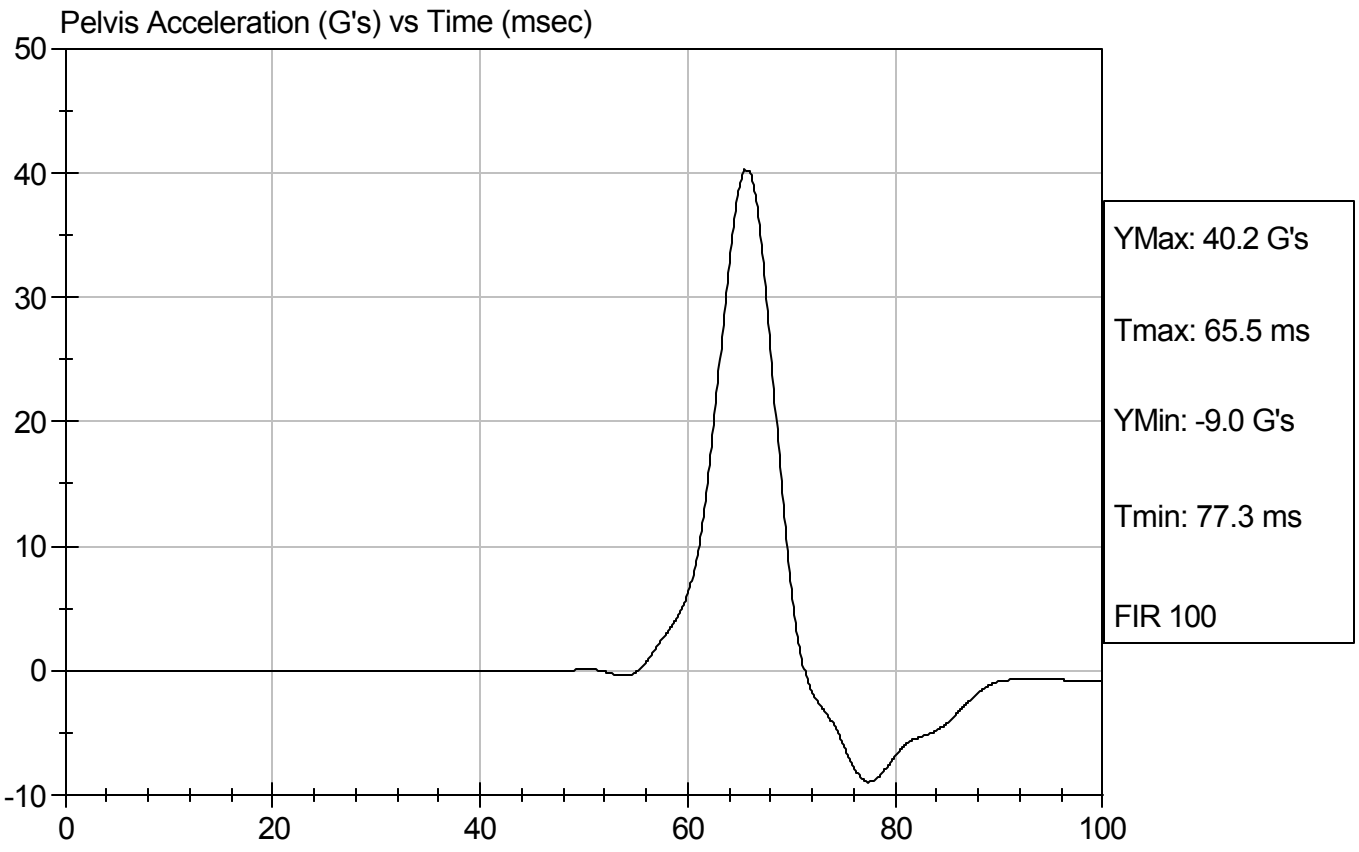
Jessica Hall
Laboratory Technician

3/18/09
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D09553

Test Date: 3/18/09
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 036 **Test I.D:** D09554

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Force At 12.7 mm	N	104 -162	144	Pass
Force At 19 mm	N	163 - 222	197	Pass
Force At 25.4 mm	N	222 - 280	262	Pass
Force At 33 mm	N	325 - 391	365	Pass
		Overall Test Results		Pass

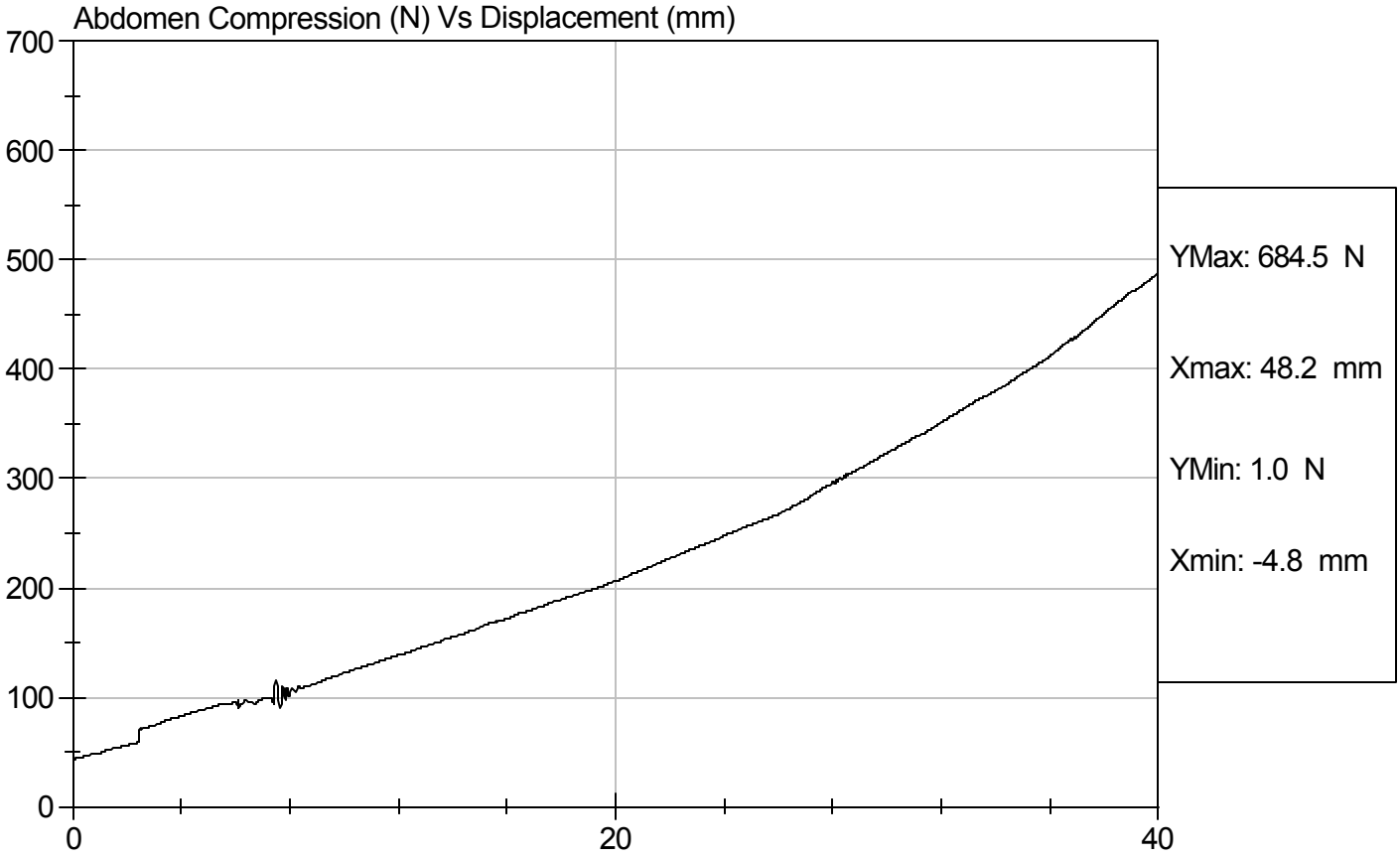
Jessica Hall
Laboratory Technician

3/18/09
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression Test Date: 3/18/09

Component: D09554 Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 036 **Test I.D:** D09555

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	129.9	Pass
Force At 30 deg	N	151.2 - 204.6	188.3	Pass
Force At 40 deg	N	204.6 - 258.0	252.4	Pass
Return Angle	Deg	12 Maximum	5	Pass
		Overall Test Results		Pass

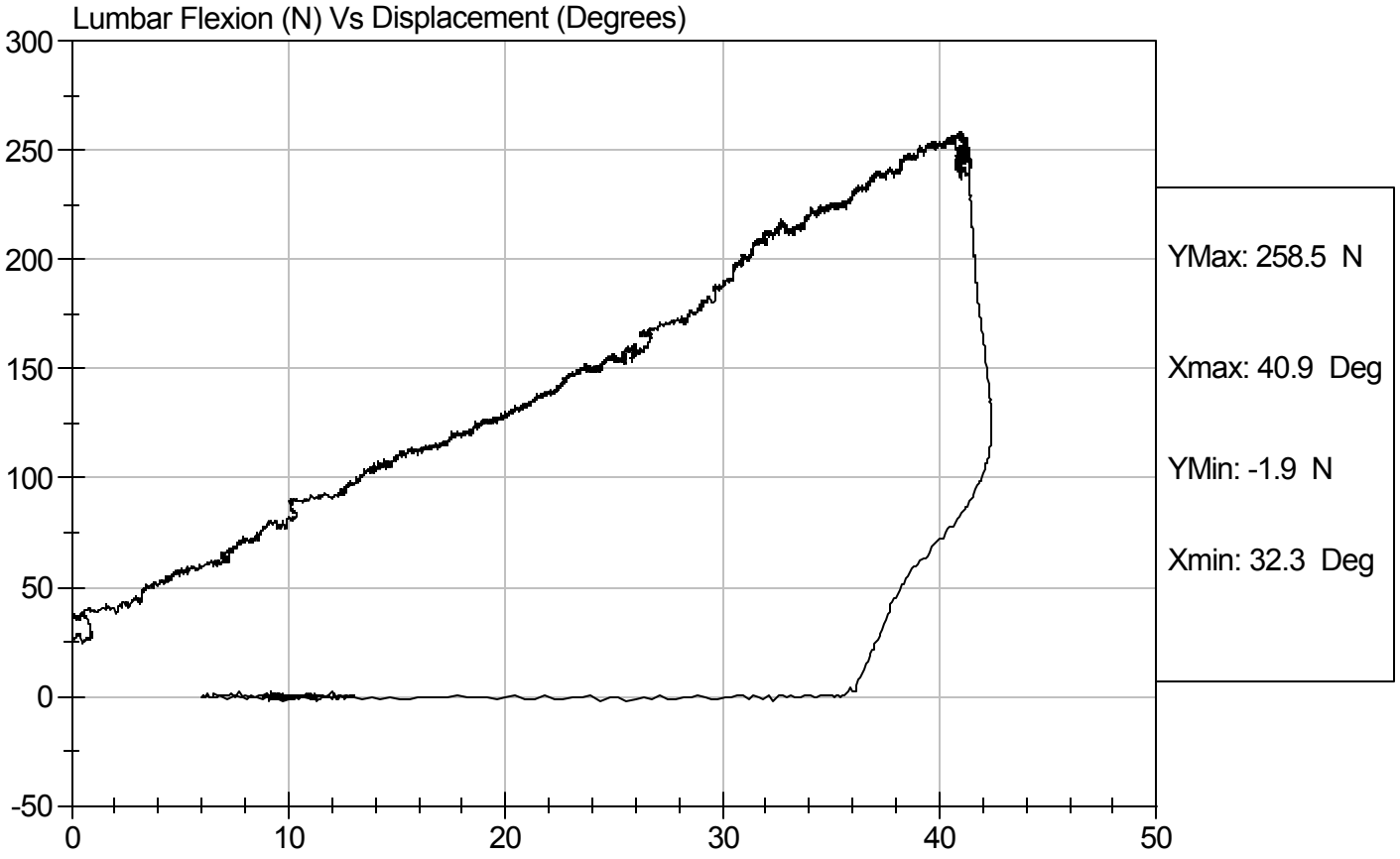
Jessica Hall
Laboratory Technician

3/18/09
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 3/18/09

Component: D09555 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Thorasic Shock Absorber Calibration

ATD Serial No: 036 **Test I.D:** D09558

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Velocity 3.05 m/s	Force	N	836 - 1125	939	Pass
	Displacement	mm	30 - 35	30.3	Pass
Velocity 4.27 m/s	Force	N	1730 - 2099	1,736	Pass
	Displacement	mm	32 - 37	34.2	Pass
Velocity 6.1 m/s	Force	N	3741 - 4448	3,772	Pass
	Displacement	mm	33 - 40	36.9	Pass
			Overall Test Results		Pass

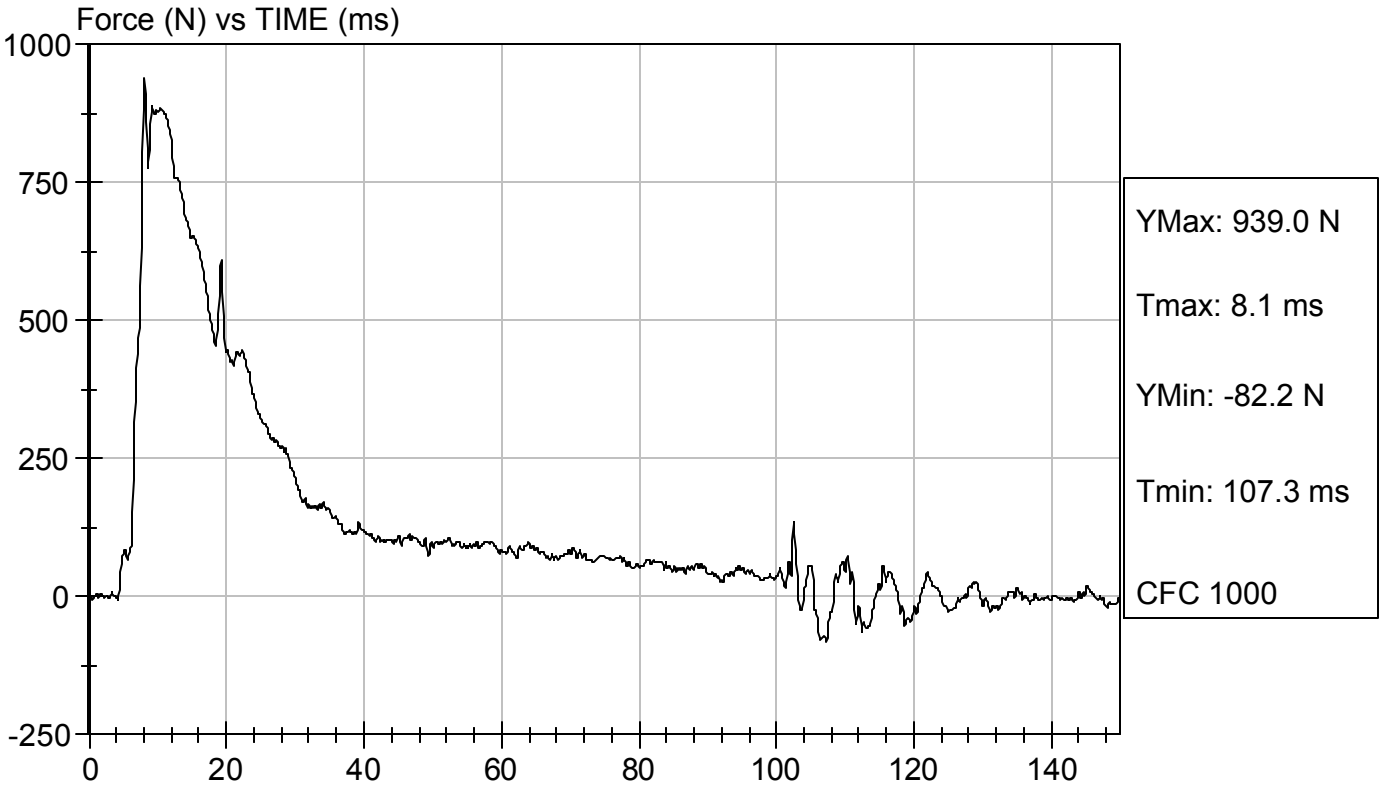
Jessica Gall
Laboratory Technician

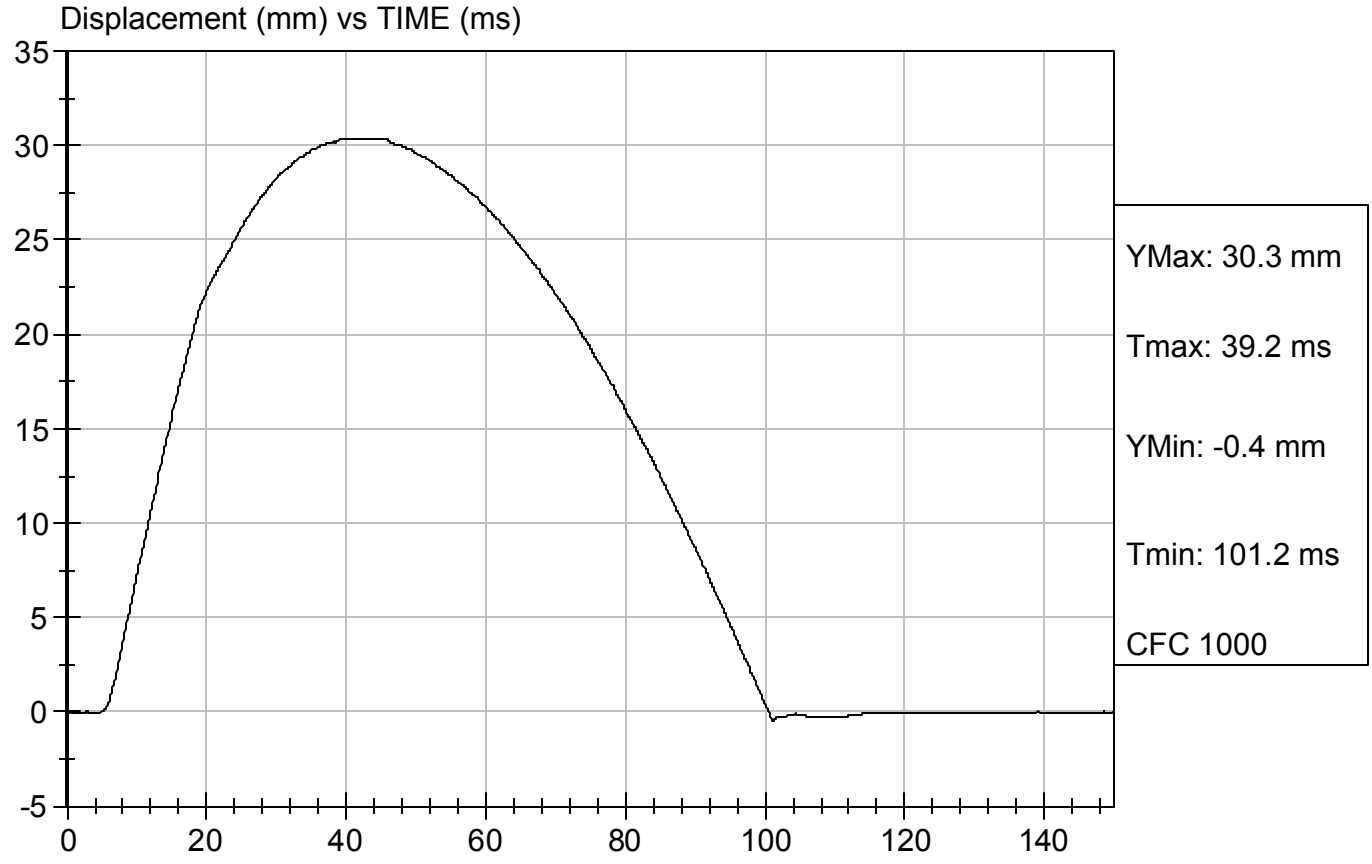
3/18/09
Test Date

David Winkelbauer
Approved By

Test Desc: Dampener Impact
Component ID: D09556

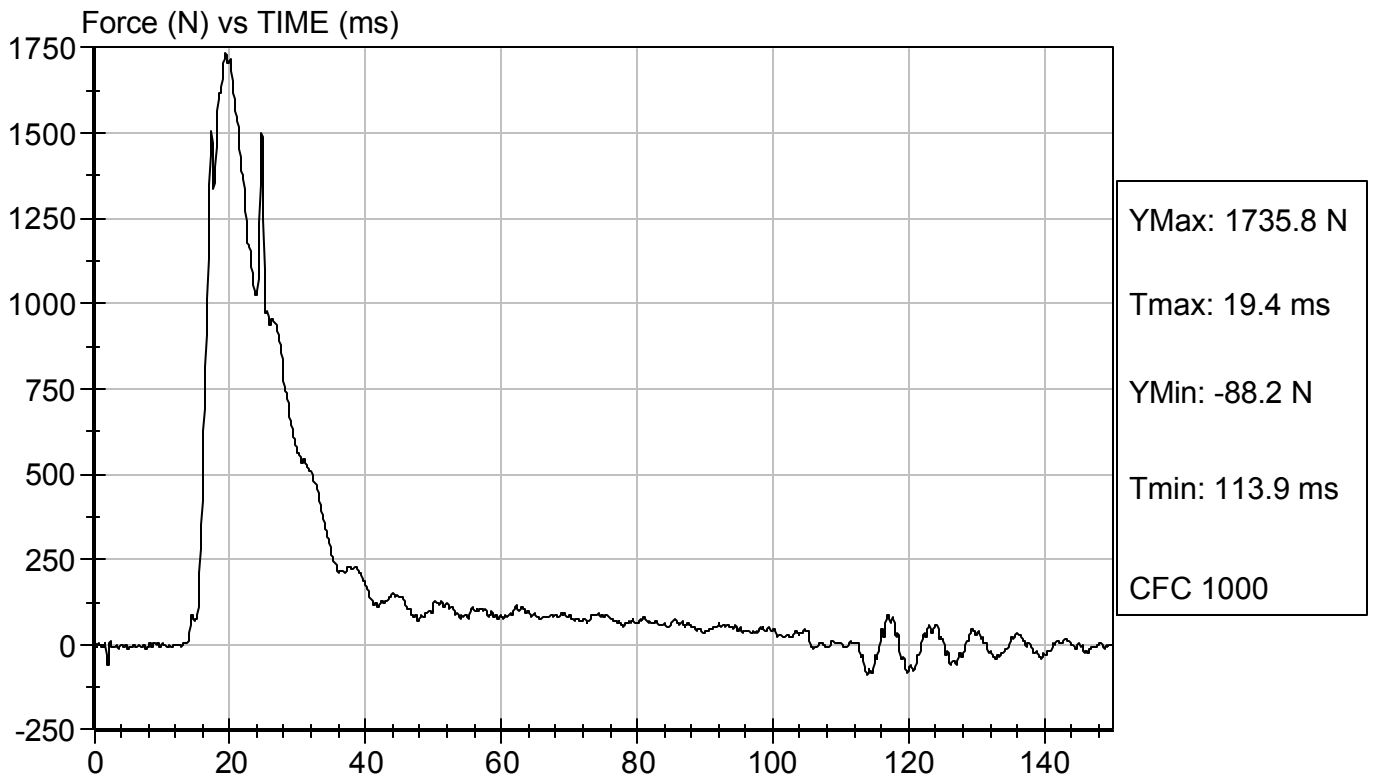
Test Date: 3/18/09
Speed: 10 ft/sec, 3.05 m/sec

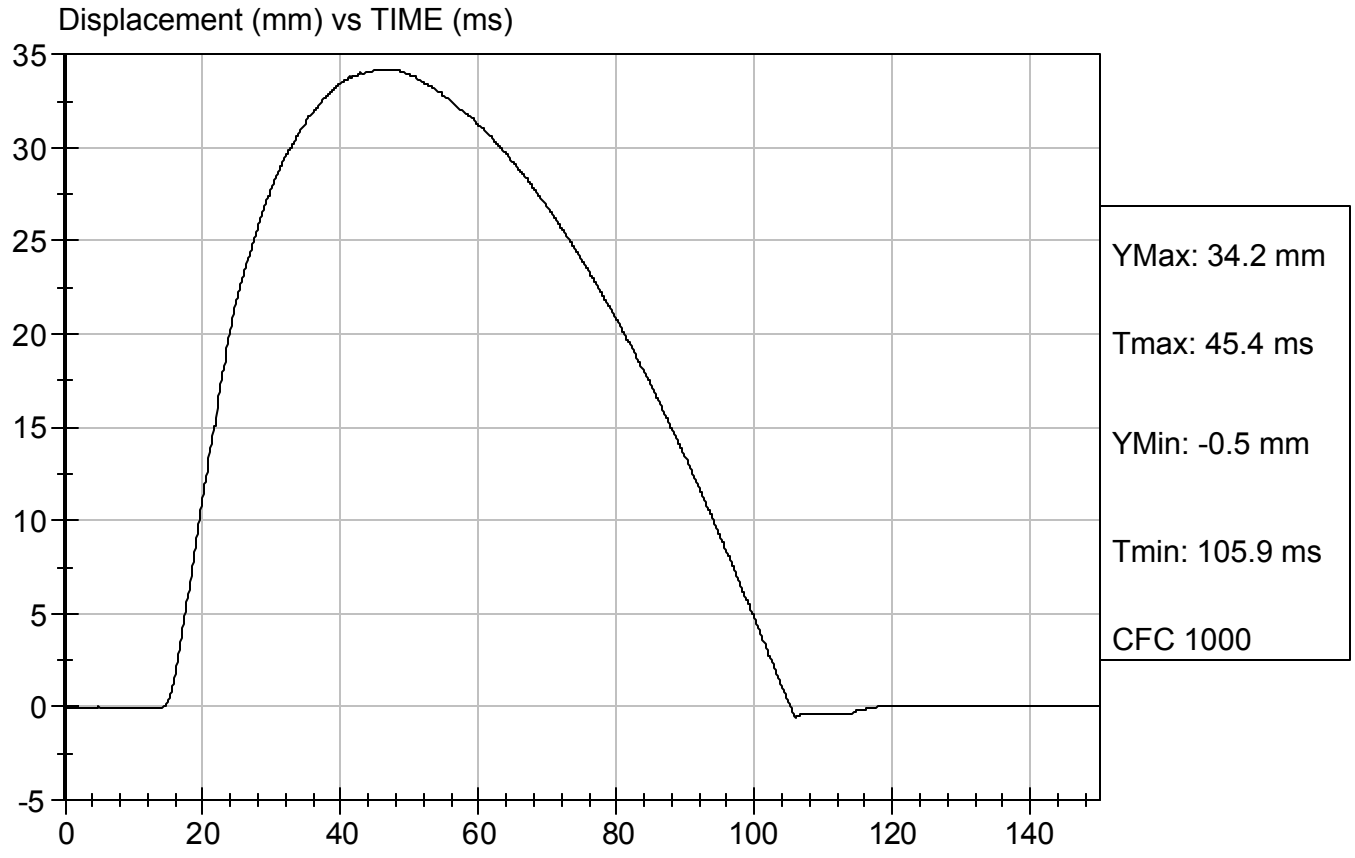




Test Desc: Dampener Impact
Component ID: D09557

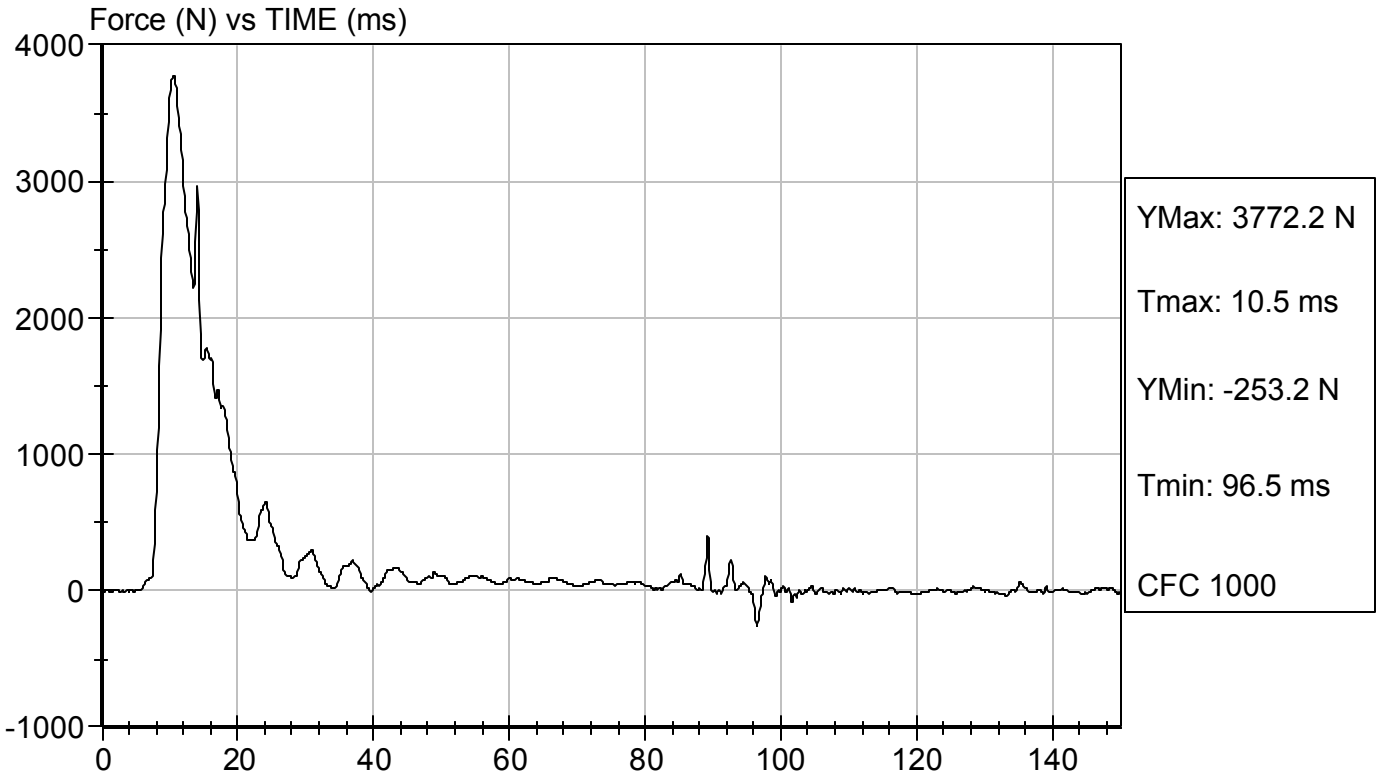
Test Date: 3/18/09
Speed: 14 ft/sec, 4.27 m/sec

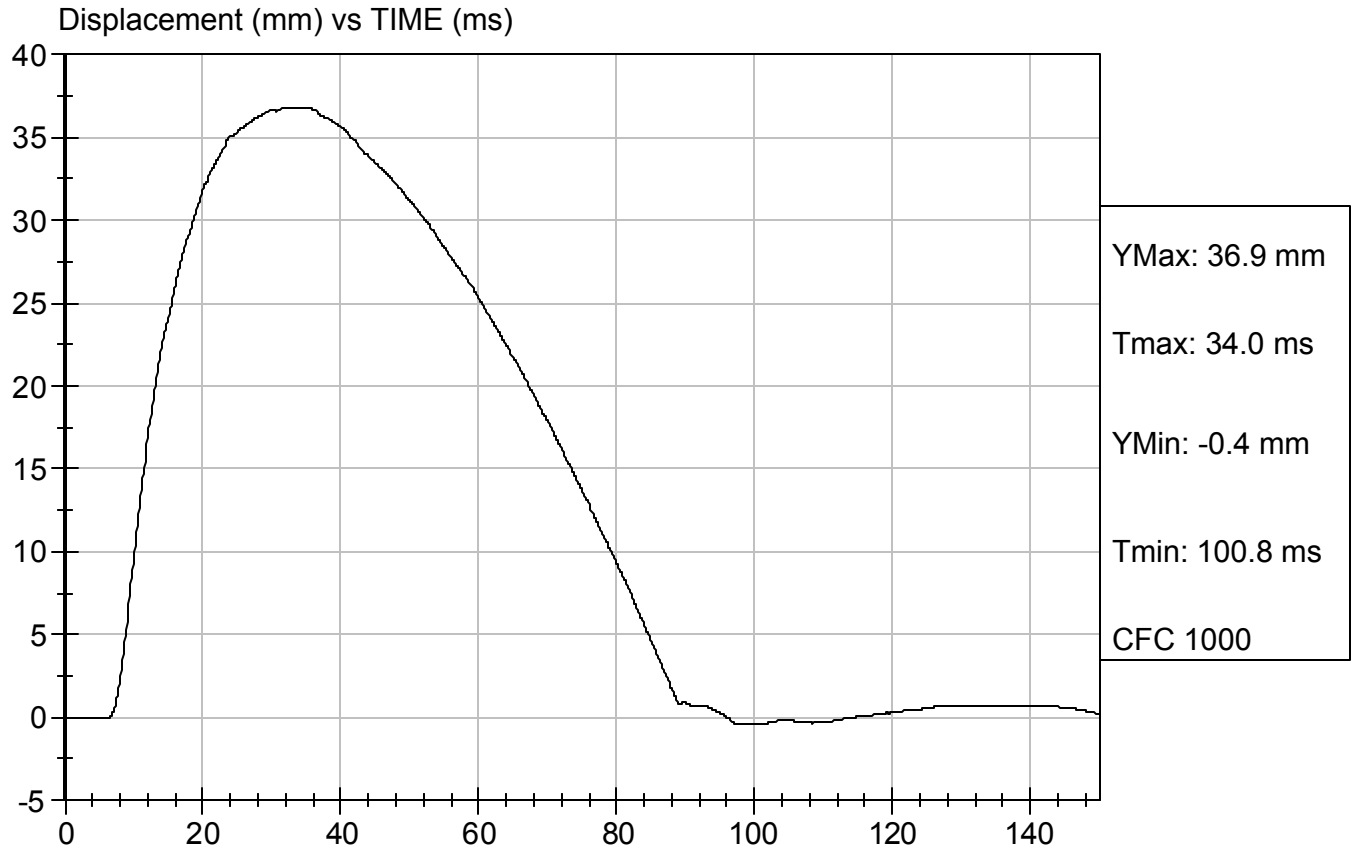




Test Desc: Dampener Impact
Component ID: D09558

Test Date: 3/18/09
Speed: 20 ft/sec, 6.10 m/sec





Calibration Test Results Summary

Dummy Serial Number: 036

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 036 **Test I.D:** D09632

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	39	Pass
Lower Spine	G's	15 - 22	19	Pass
		Overall Test Results		Pass

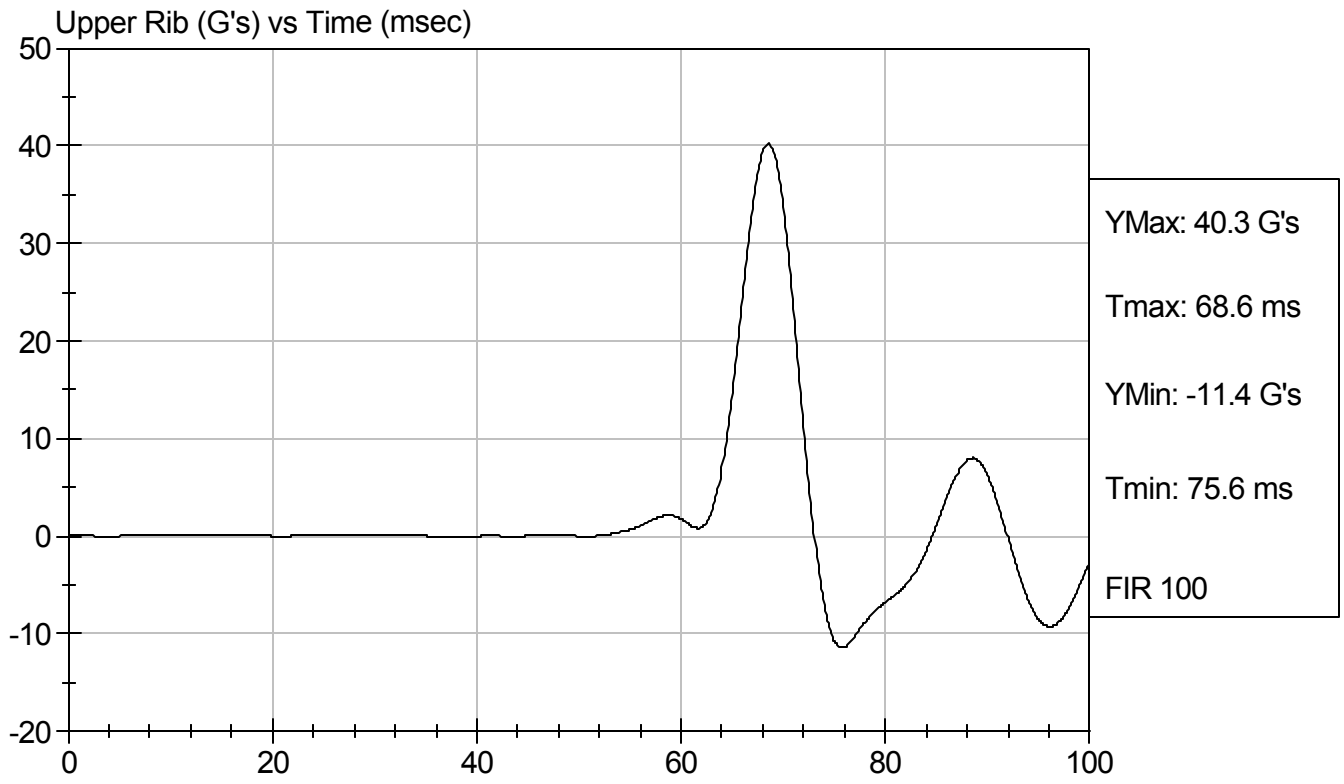
Jessica Gall
Laboratory Technician

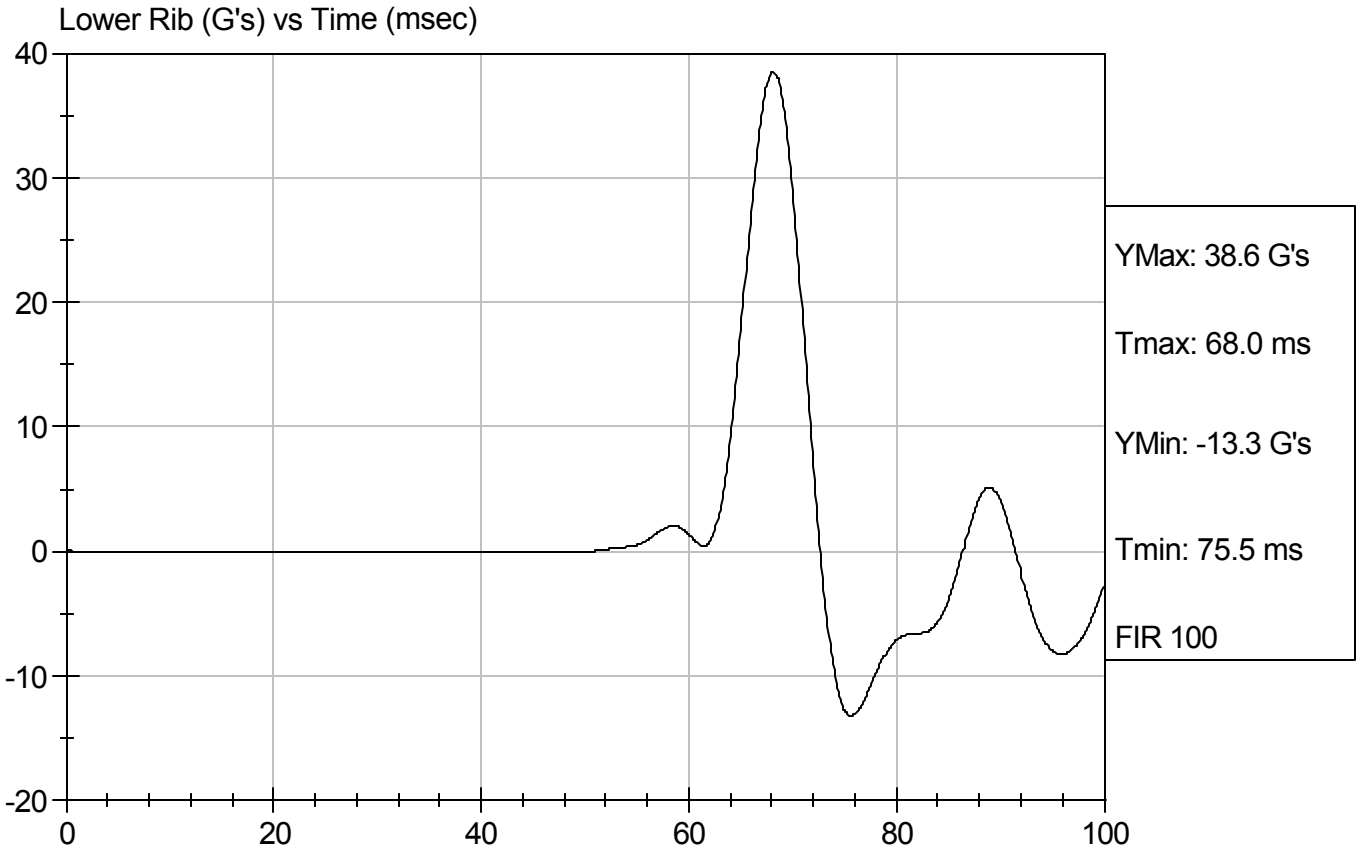
3/24/09
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D09632

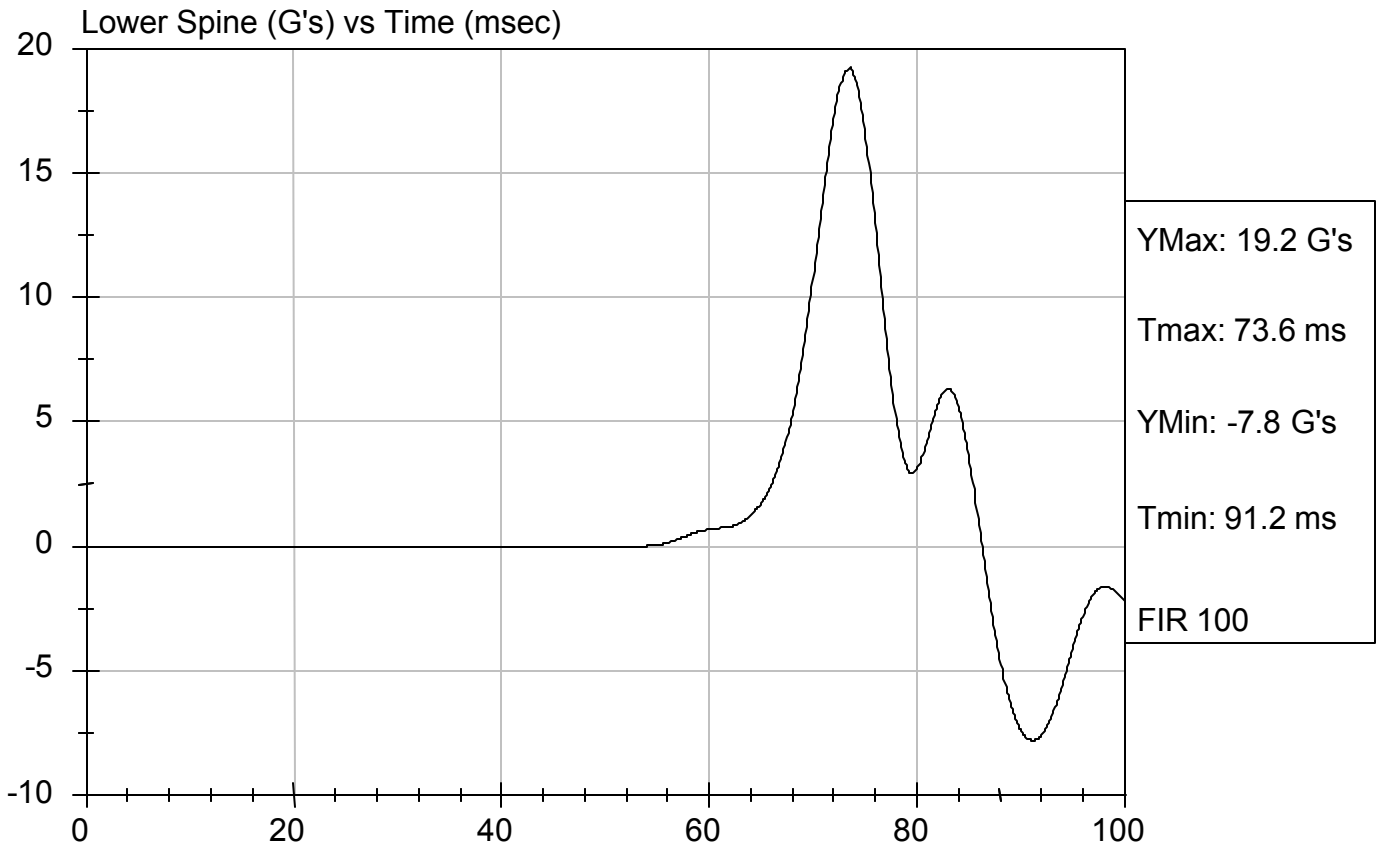
Test Date: 3/24/09
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D09632

Test Date: 3/24/09
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 036 **Test I.D:** D09633

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Probe Velocity	m/s	4.27 - 4.33	4.27	Pass
Pelvis Acceleration	G's	40 - 60	41	Pass
		Overall Test Results		Pass

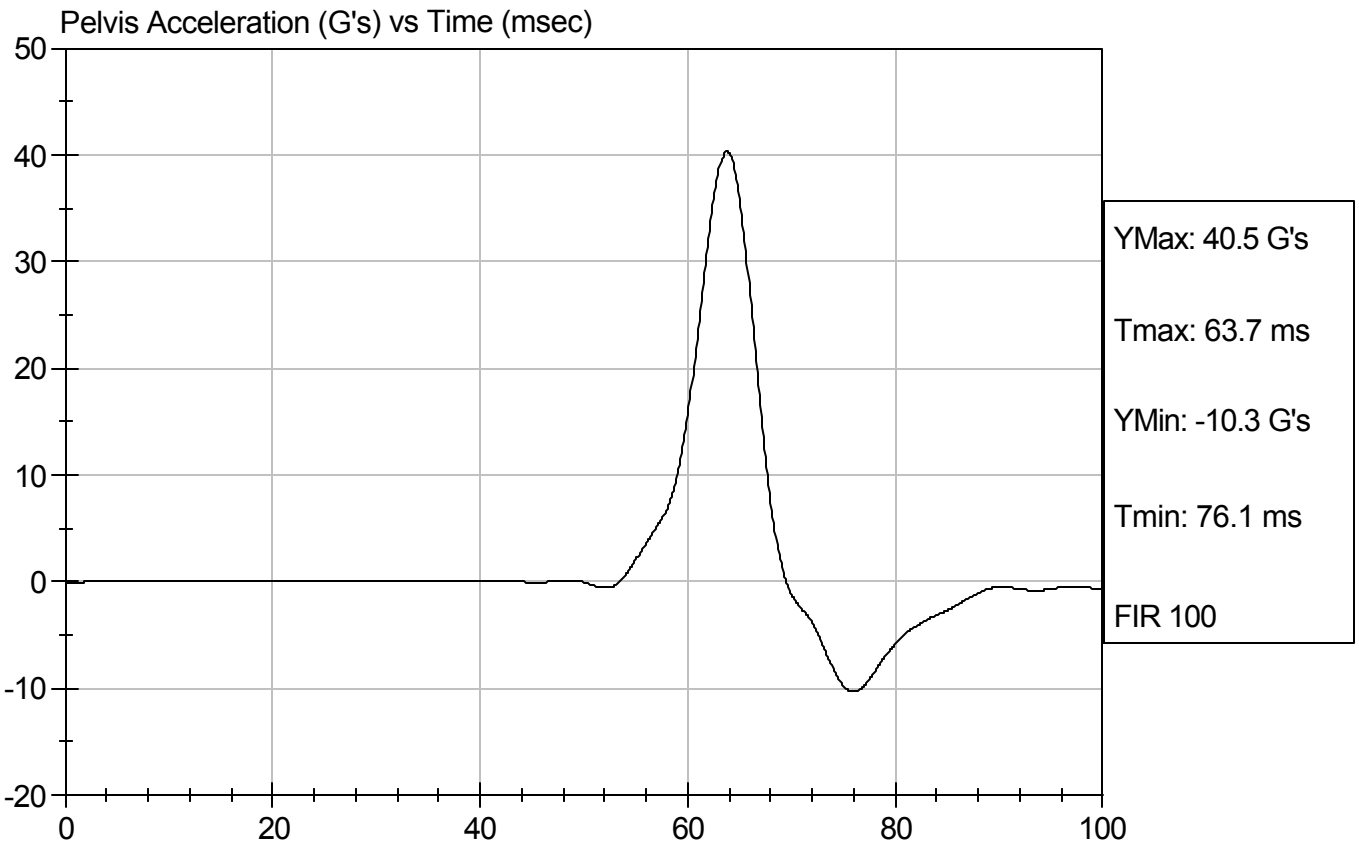
Jessica Hall
Laboratory Technician

3/24/09
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D09633

Test Date: 3/24/09
Speed: 14.02 ft/sec, 4.27 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 036 **Test I.D:** D09634

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Force At 12.7 mm	N	104 -162	151	Pass
Force At 19 mm	N	163 - 222	207	Pass
Force At 25.4 mm	N	222 - 280	277	Pass
Force At 33 mm	N	325 - 391	375	Pass
		Overall Test Results		Pass

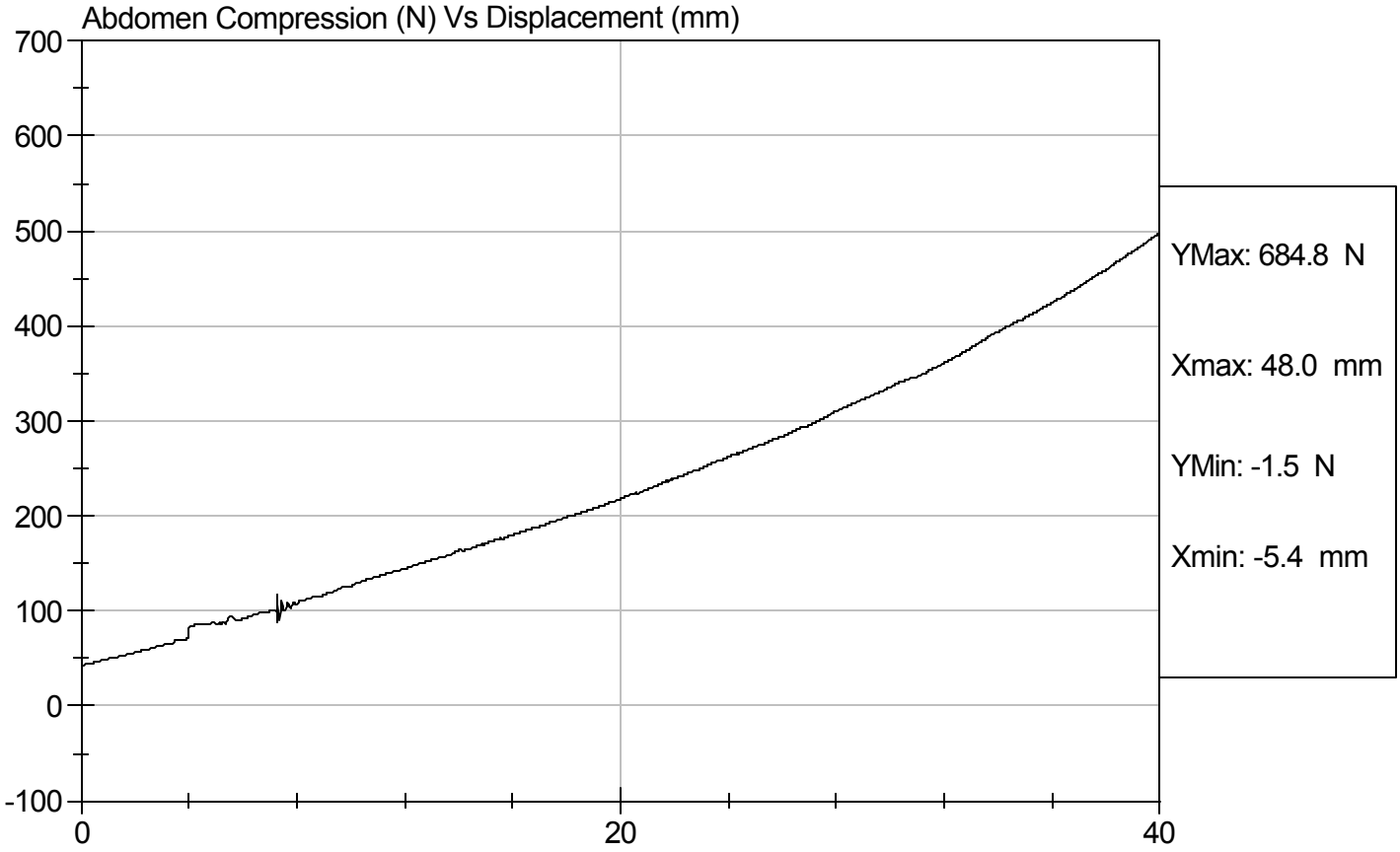
Jessica Gall
Laboratory Technician

3/24/09
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression | Test Date: 3/24/09

Component: D09634 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 036 **Test I.D:** D09635

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	119.4	Pass
Force At 30 deg	N	151.2 - 204.6	166.7	Pass
Force At 40 deg	N	204.6 - 258.0	221.7	Pass
Return Angle	Deg	12 Maximum	6	Pass
		Overall Test Results		Pass

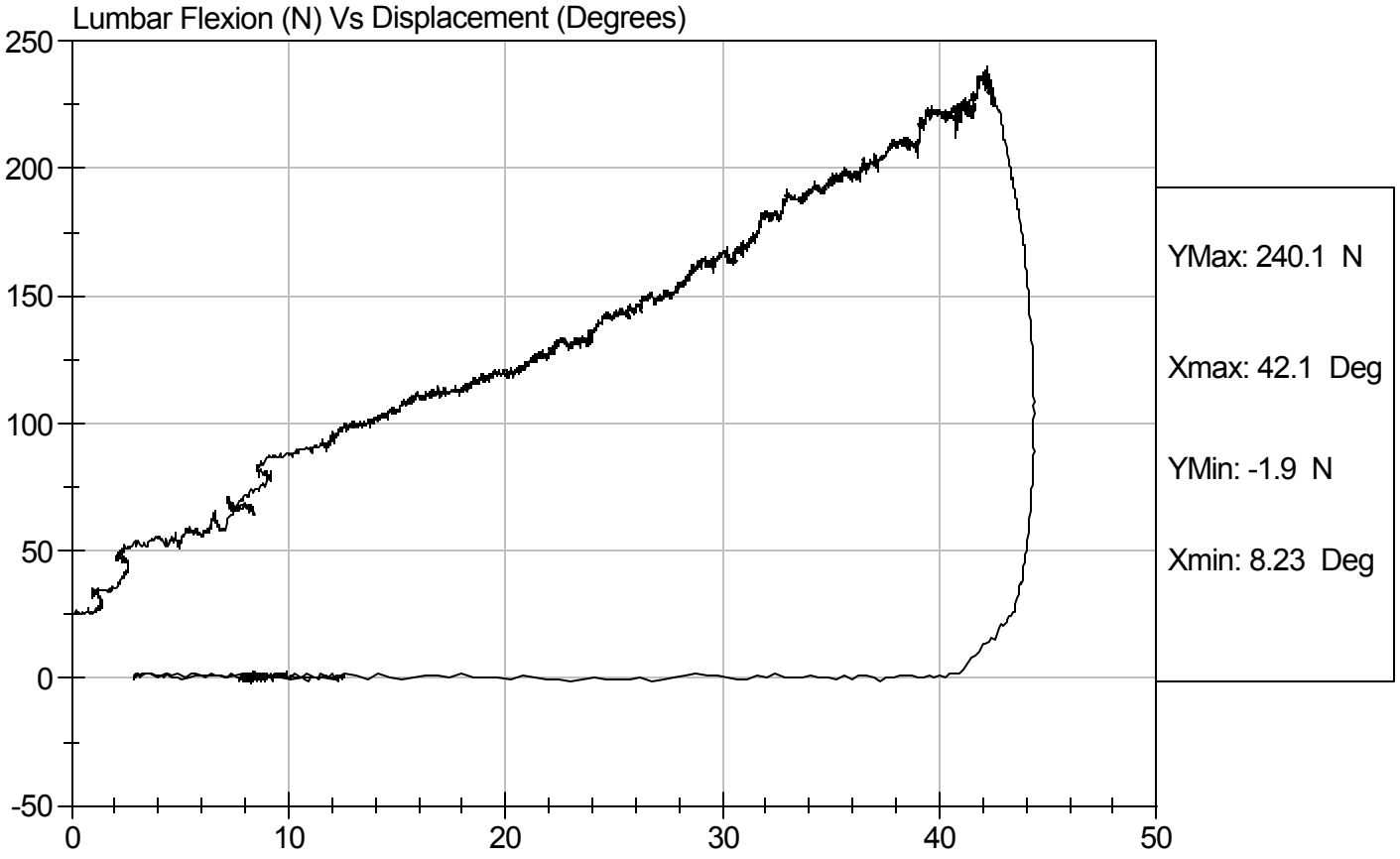
Jessica Hall
Laboratory Technician

3/24/09
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 3/24/09

Component: D09635 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 036

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass

Jessica Hall
Laboratory Technician

03/25/2009
Test Date

David Winkelbauer
Approved By

CERTIFICATION DATA

Dummy Serial Number: 037

Calibration Test Results Summary

Dummy Serial Number: 037

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet

Side Impact Dummy

External Measurements

ATD Serial No: 037 **Test I.D:** D0956

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	904	Pass
RH - Rib Height	mm	501 - 521	507	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	234	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	523	Pass
SW - Knee Pivot to Floor	mm	490 - 505	493	Pass
HW - Hip Width	mm	356 - 391	366	Pass
		Overall Test Results		Pass

Jessica Gall
Laboratory Technician

3/18/2009
Test Date

David Winkelbauer
Approved By

SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 037 **Test I.D:** D09562

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Probe Velocity	m/s	4.22 - 4.31	4.27	Pass
Upper Rib	G's	37 - 46	42	Pass
Lower Rib	G's	37 - 46	40	Pass
Lower Spine	G's	15 - 22	21	Pass
		Overall Test Results		Pass

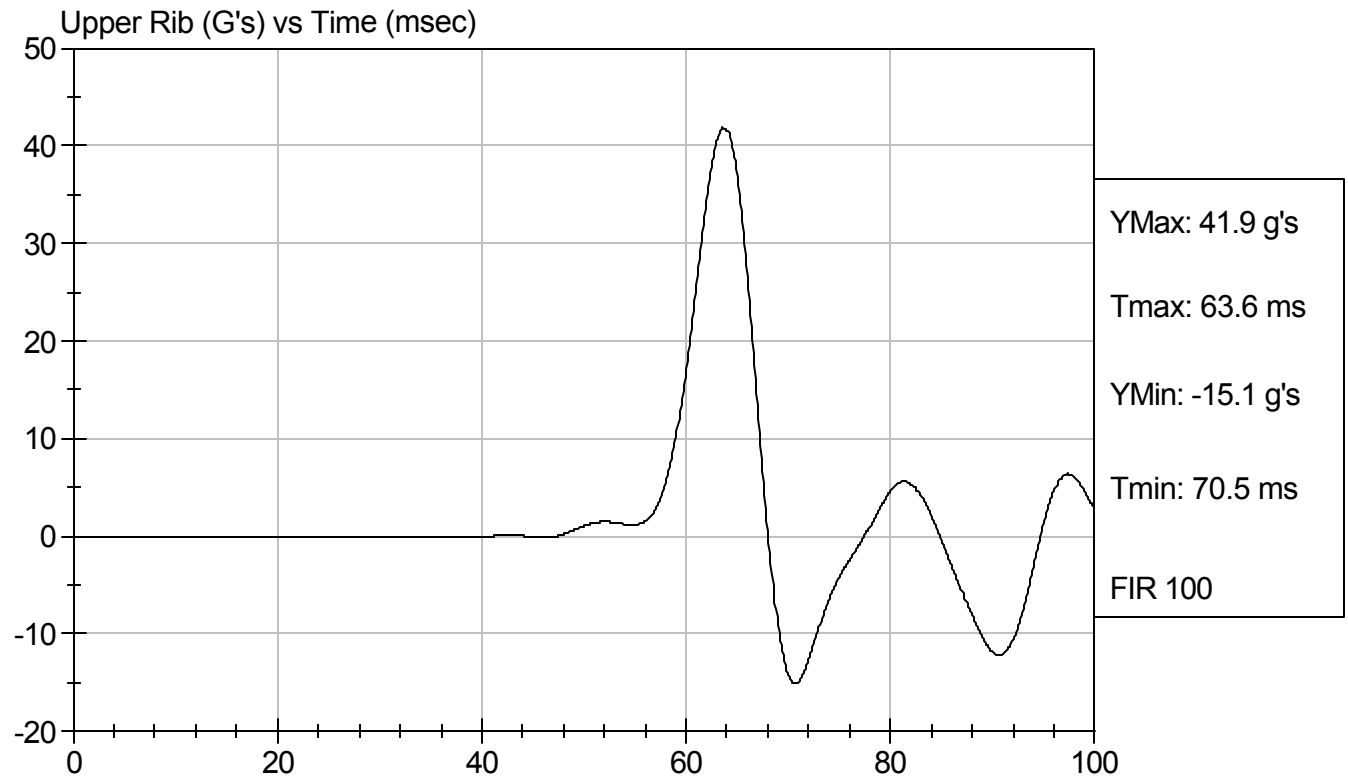
Jessica Hall
Laboratory Technician

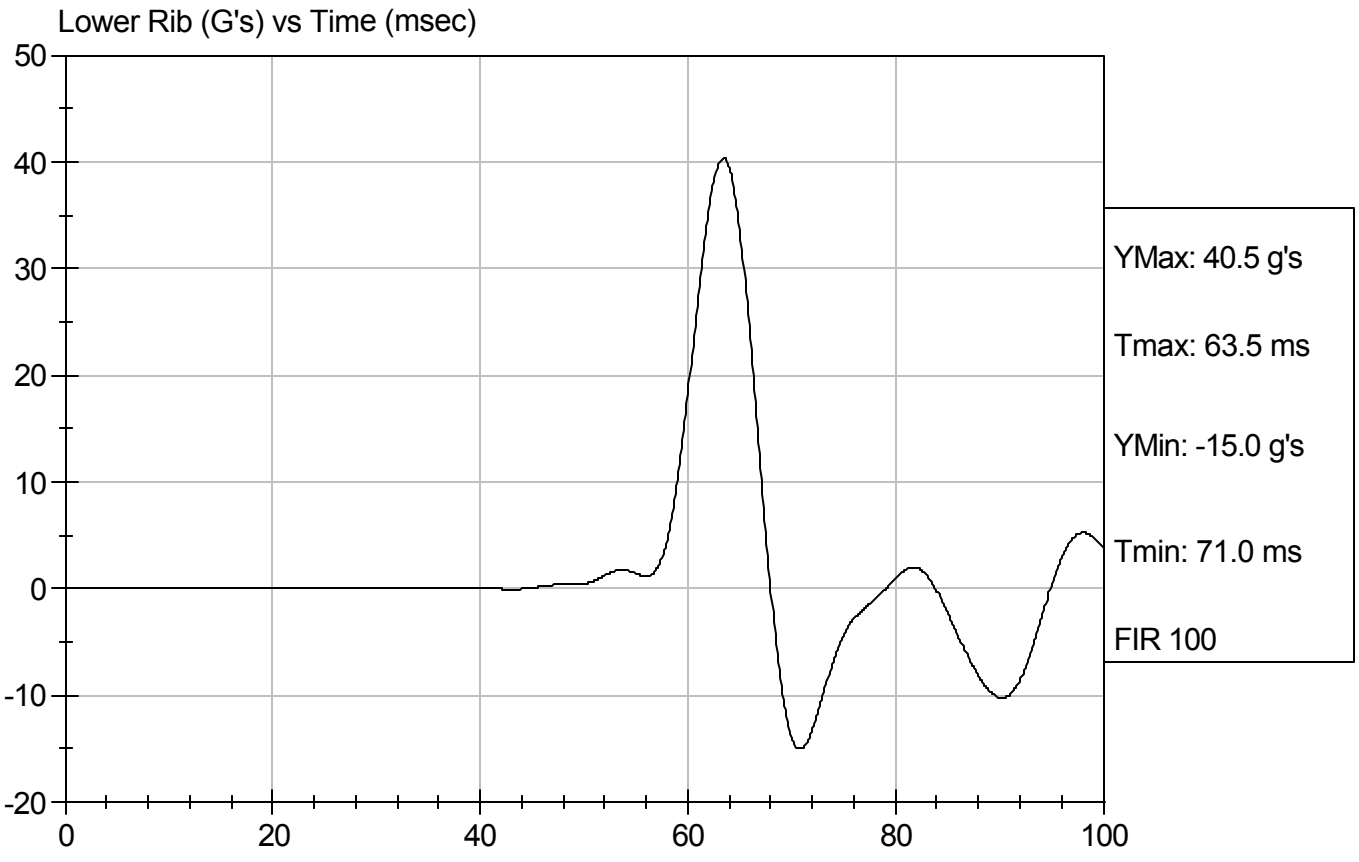
3/18/09
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D09562

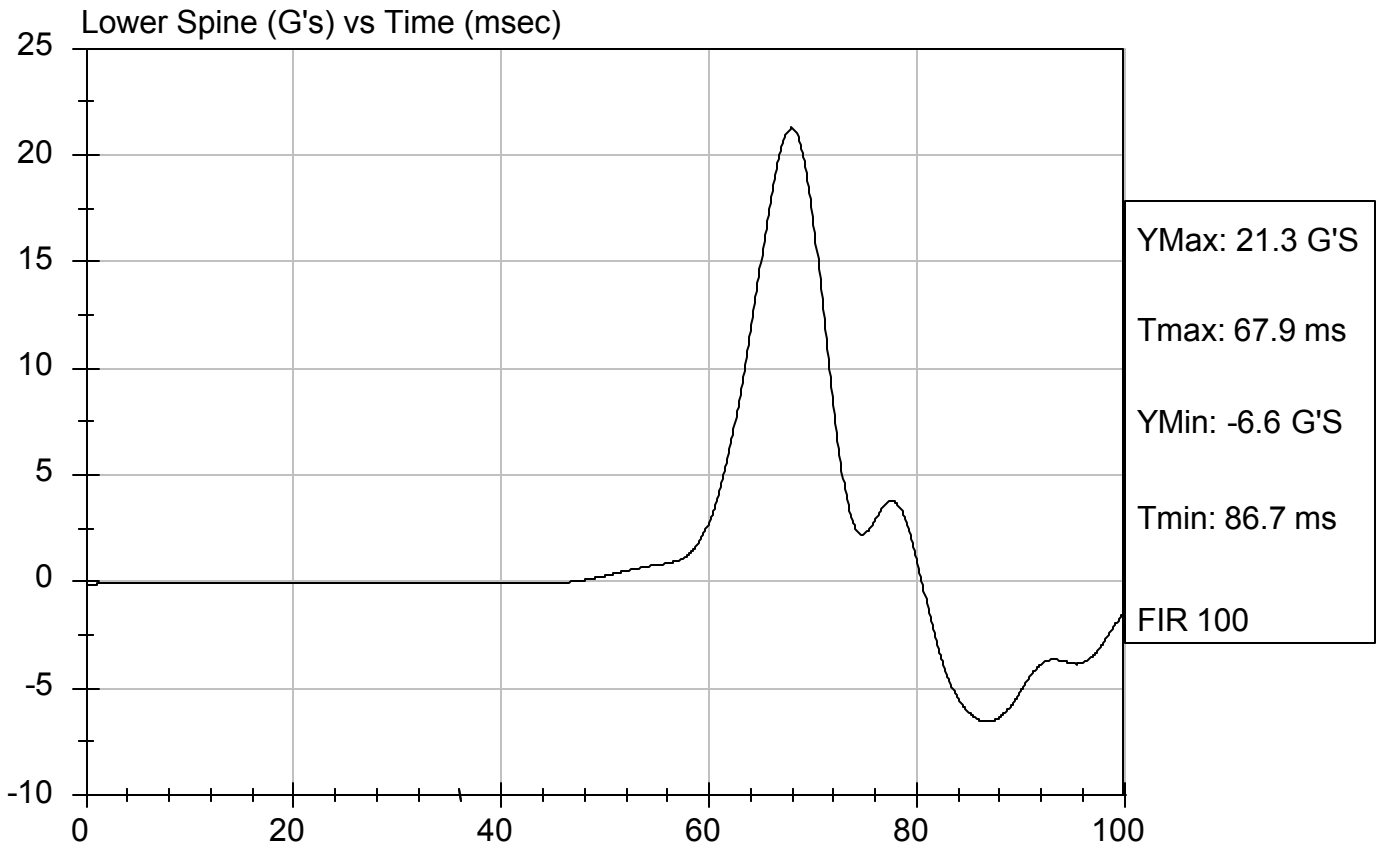
Test Date: 3/18/09
Speed: 14.01 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D09562

Test Date: 3/18/09
Speed: 14.01 ft/sec, 4.27 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 037 **Test I.D:** D09563

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Probe Velocity	m/s	4.27 - 4.33	4.27	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
		Overall Test Results		Pass

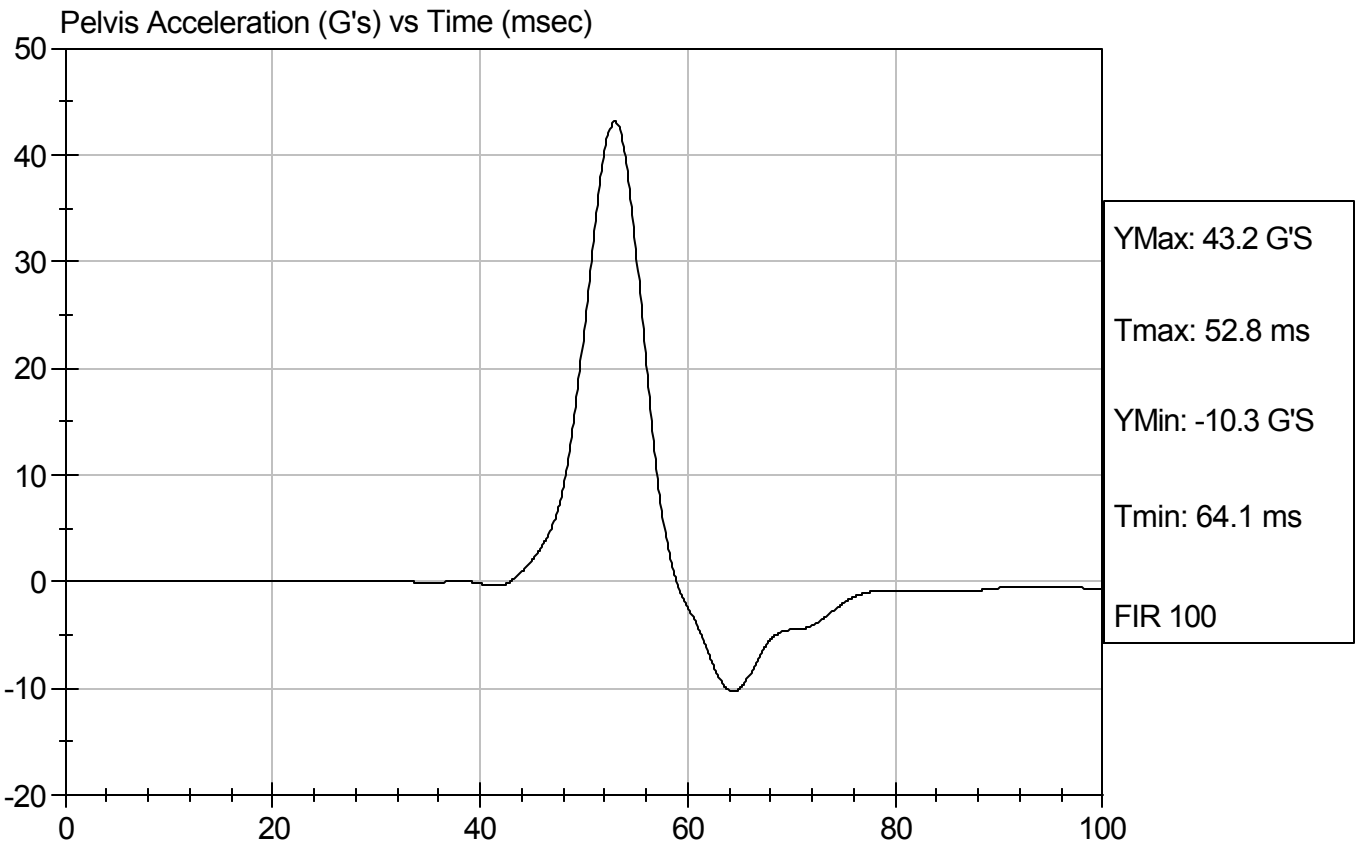
Jessica Hall
Laboratory Technician

3/18/09
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D09563

Test Date: 3/18/09
Speed: 14.01 ft/sec, 4.27 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 037 **Test I.D:** D09564

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Force At 12.7 mm	N	104 -162	127	Pass
Force At 19 mm	N	163 - 222	192	Pass
Force At 25.4 mm	N	222 - 280	273	Pass
Force At 33 mm	N	325 - 391	387	Pass
		Overall Test Results		Pass

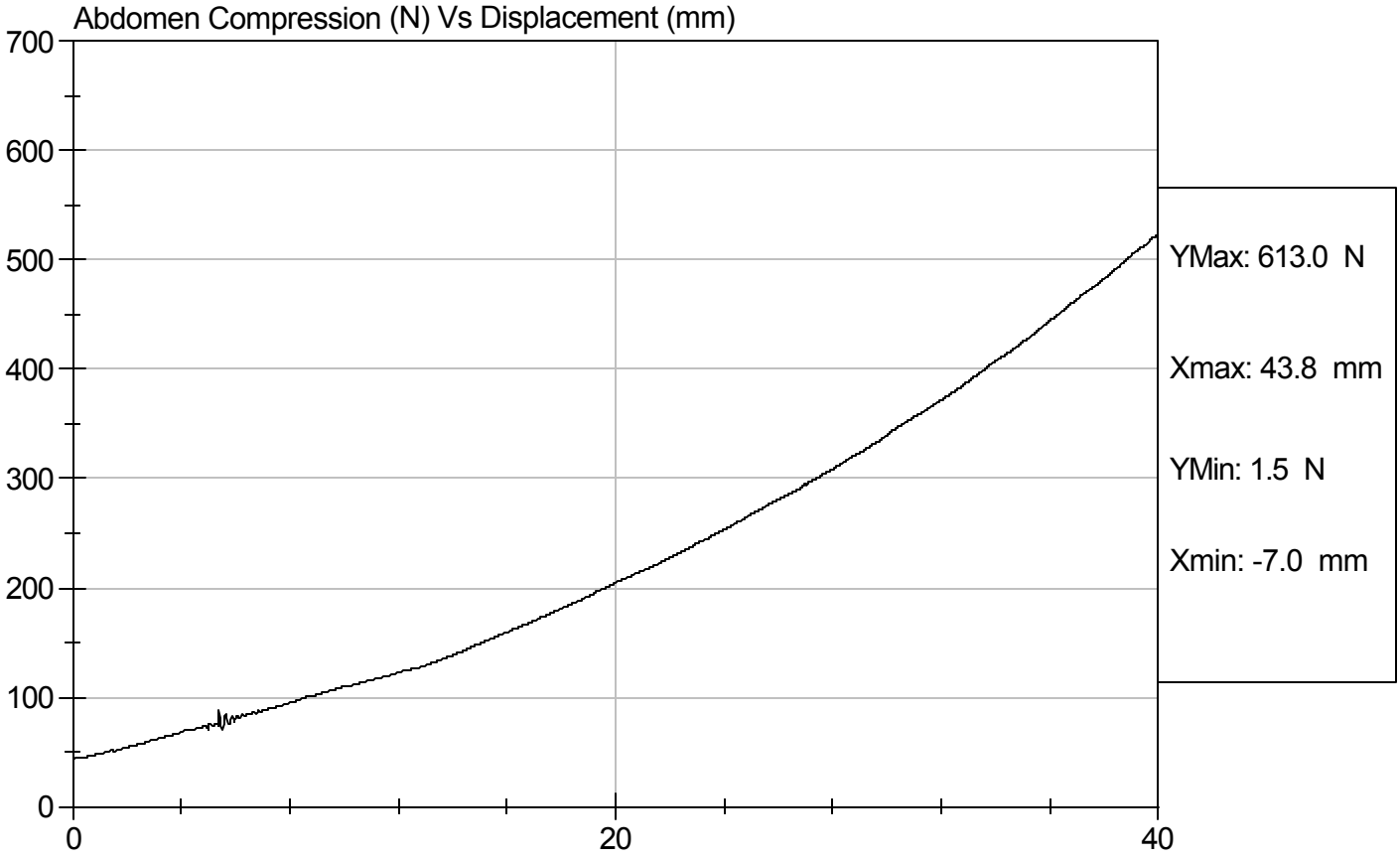
Jessica Hall
Laboratory Technician

3/18/09
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression | Test Date: 3/18/09

Component: D09564 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 037 **Test I.D:** D09565

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	121.0	Pass
Force At 30 deg	N	151.2 - 204.6	167.4	Pass
Force At 40 deg	N	204.6 - 258.0	237.6	Pass
Return Angle	Deg	12 Maximum	6	Pass
		Overall Test Results		Pass

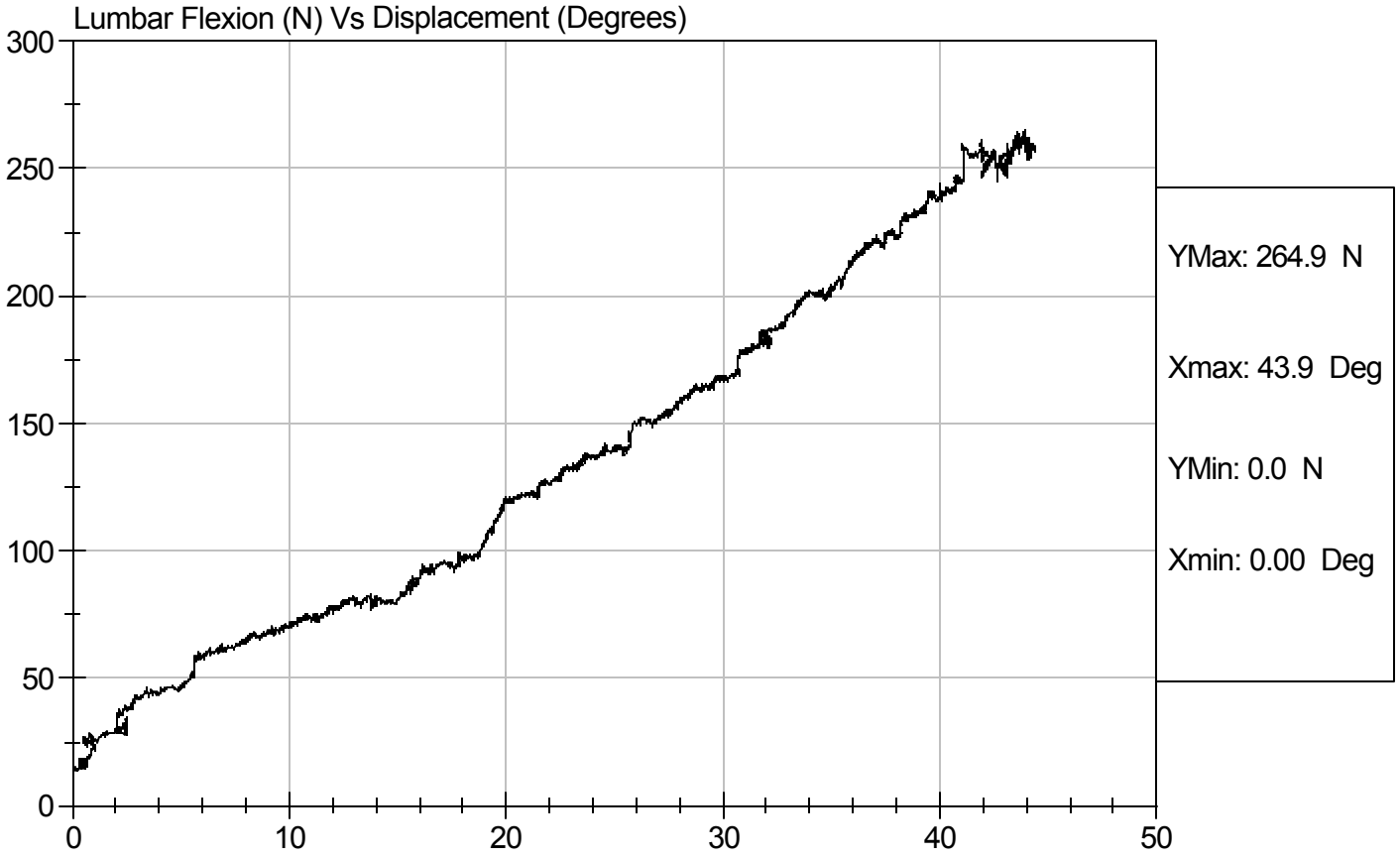
Jessica Gall
Laboratory Technician

3/18/09
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 3/18/09

Component: D09565 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Thorasic Shock Absorber Calibration

ATD Serial No: 037 **Test I.D:** D09568

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Velocity 3.05 m/s	Force	N	836 - 1125	963	Pass
	Displacement	mm	30 - 35	34.1	Pass
Velocity 4.27 m/s	Force	N	1730 - 2099	1,779	Pass
	Displacement	mm	32 - 37	36.8	Pass
Velocity 6.1 m/s	Force	N	3741 - 4448	3,766	Pass
	Displacement	mm	33 - 40	38.4	Pass
			Overall Test Results		Pass

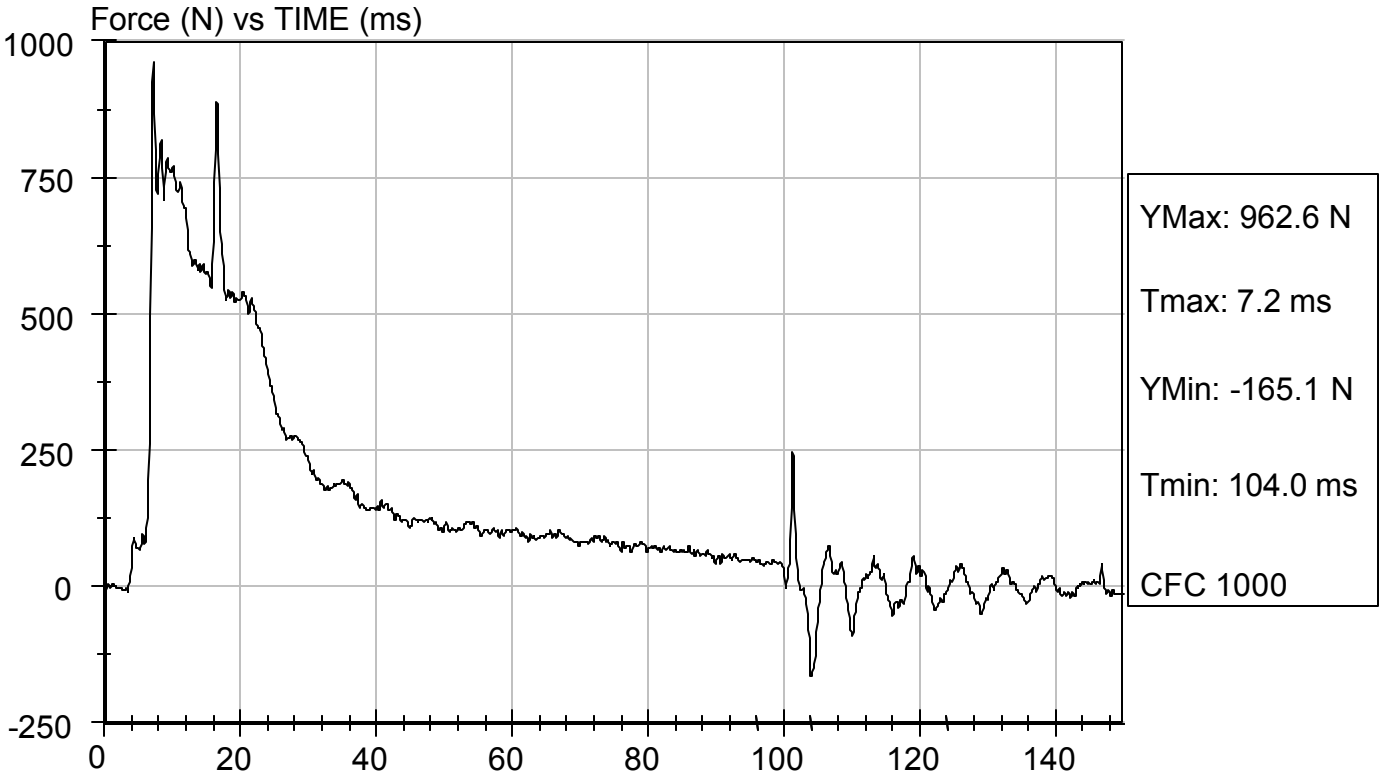
Jessica Hall
Laboratory Technician

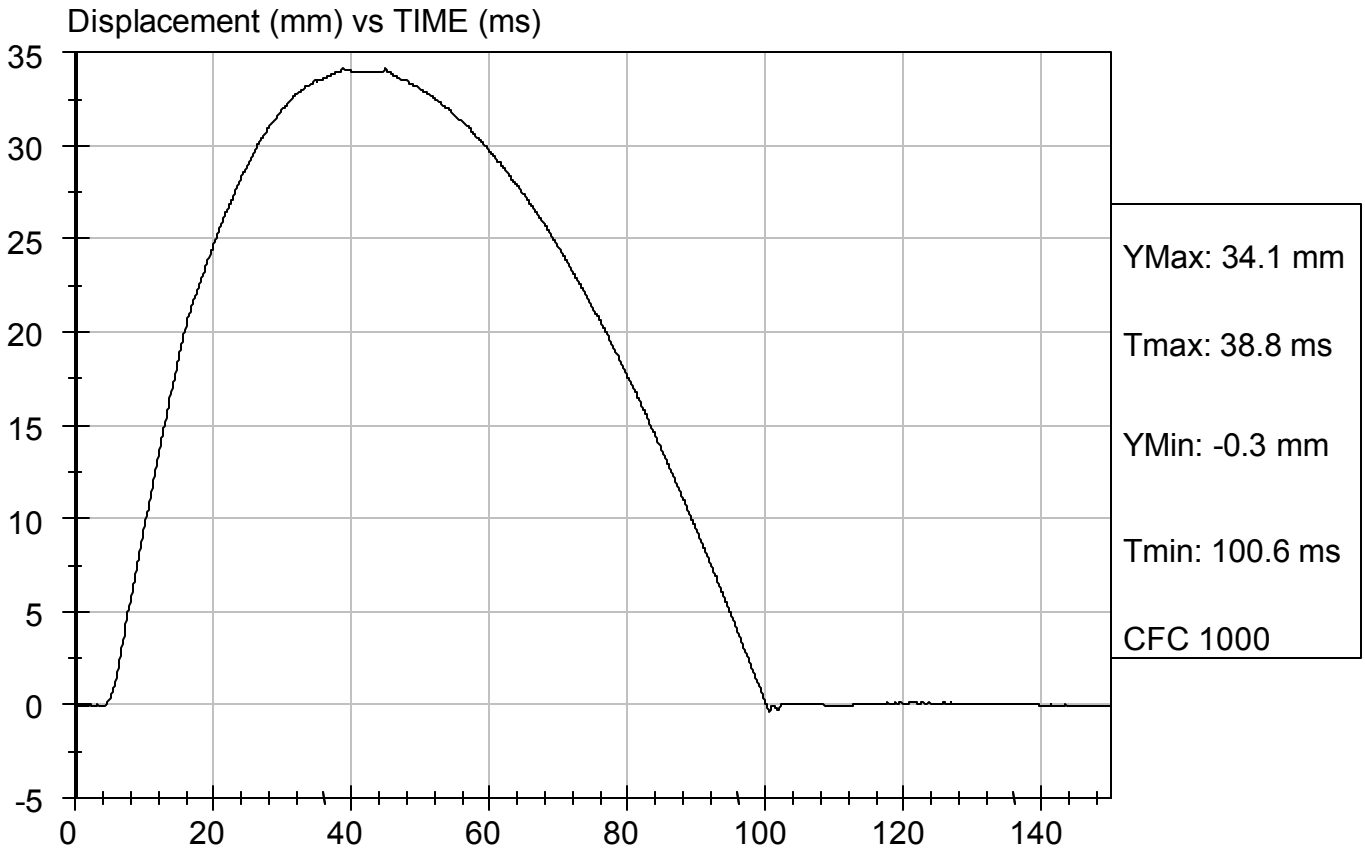
3/18/09
Test Date

David Winkelbauer
Approved By

Test Desc: Dampener Impact
Component ID: D09566

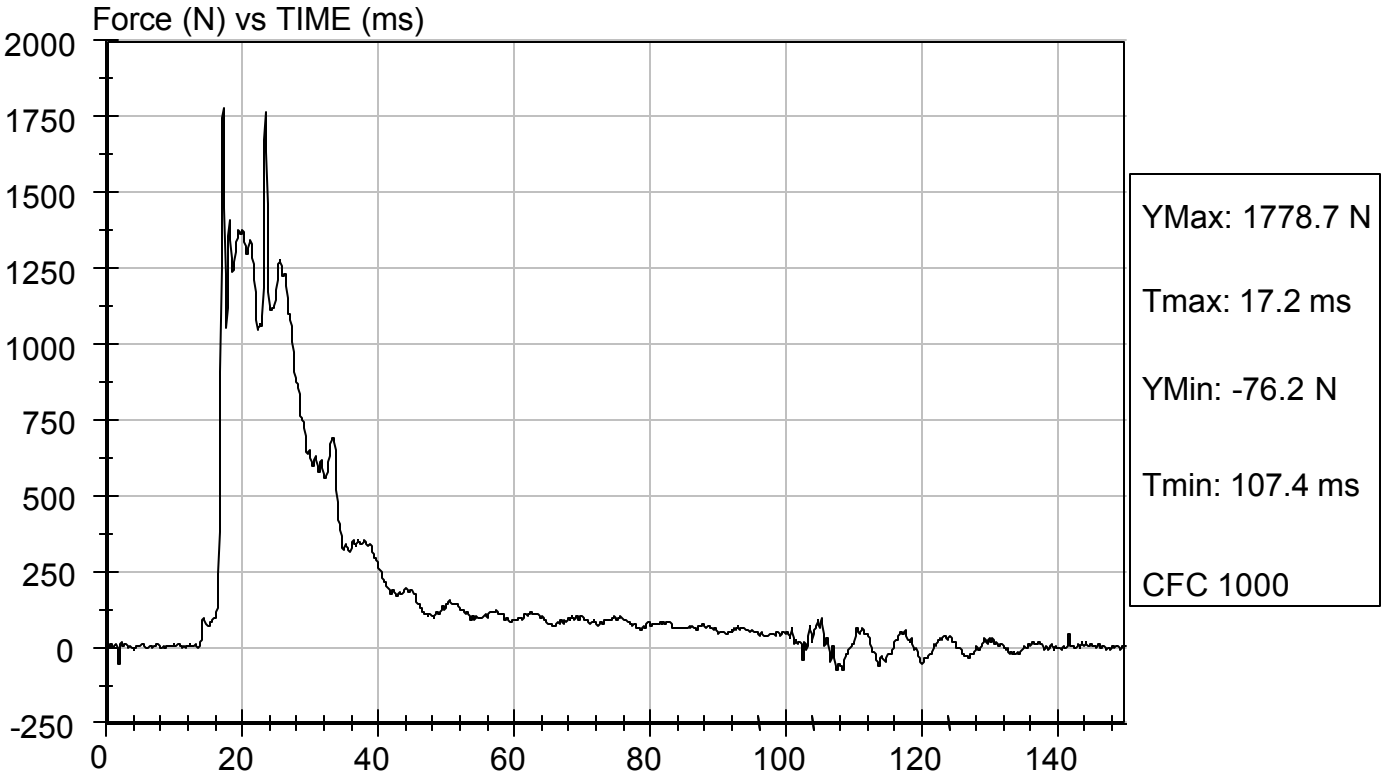
Test Date: 3/18/09
Speed: 10 ft/sec, 3.05 m/sec

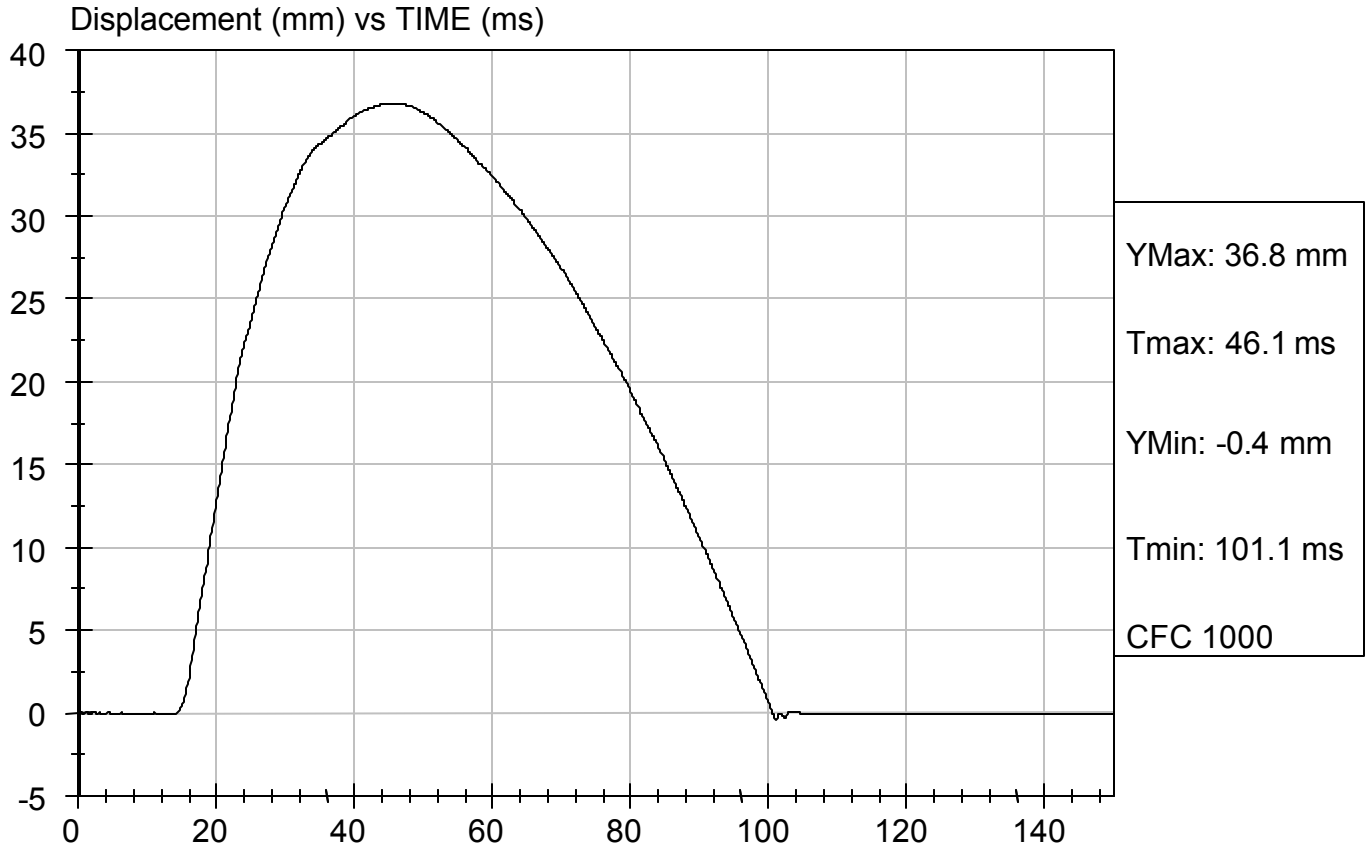




Test Desc: Dampener Impact
Component ID: D09567

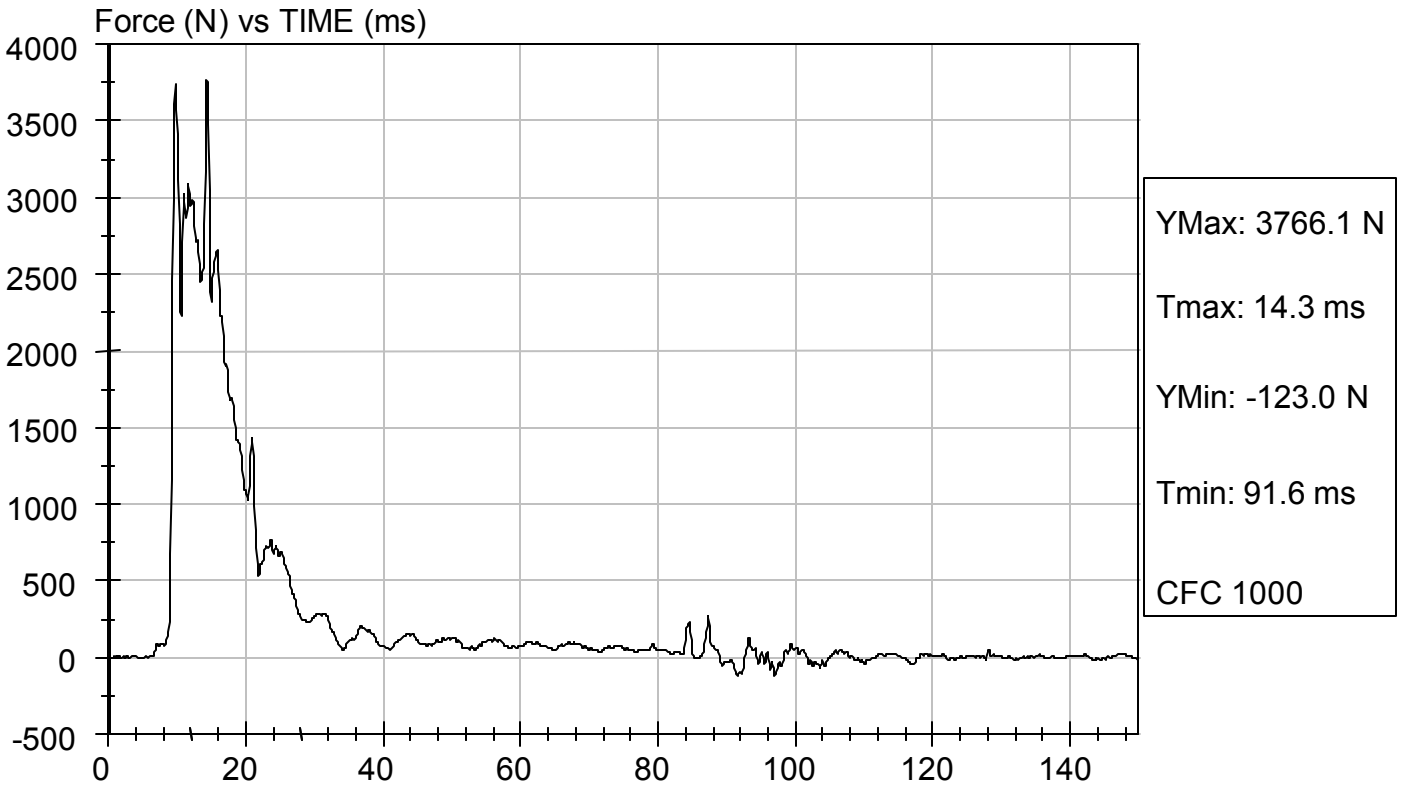
Test Date: 3/18/09
Speed: 14 ft/sec, 4.27 m/sec

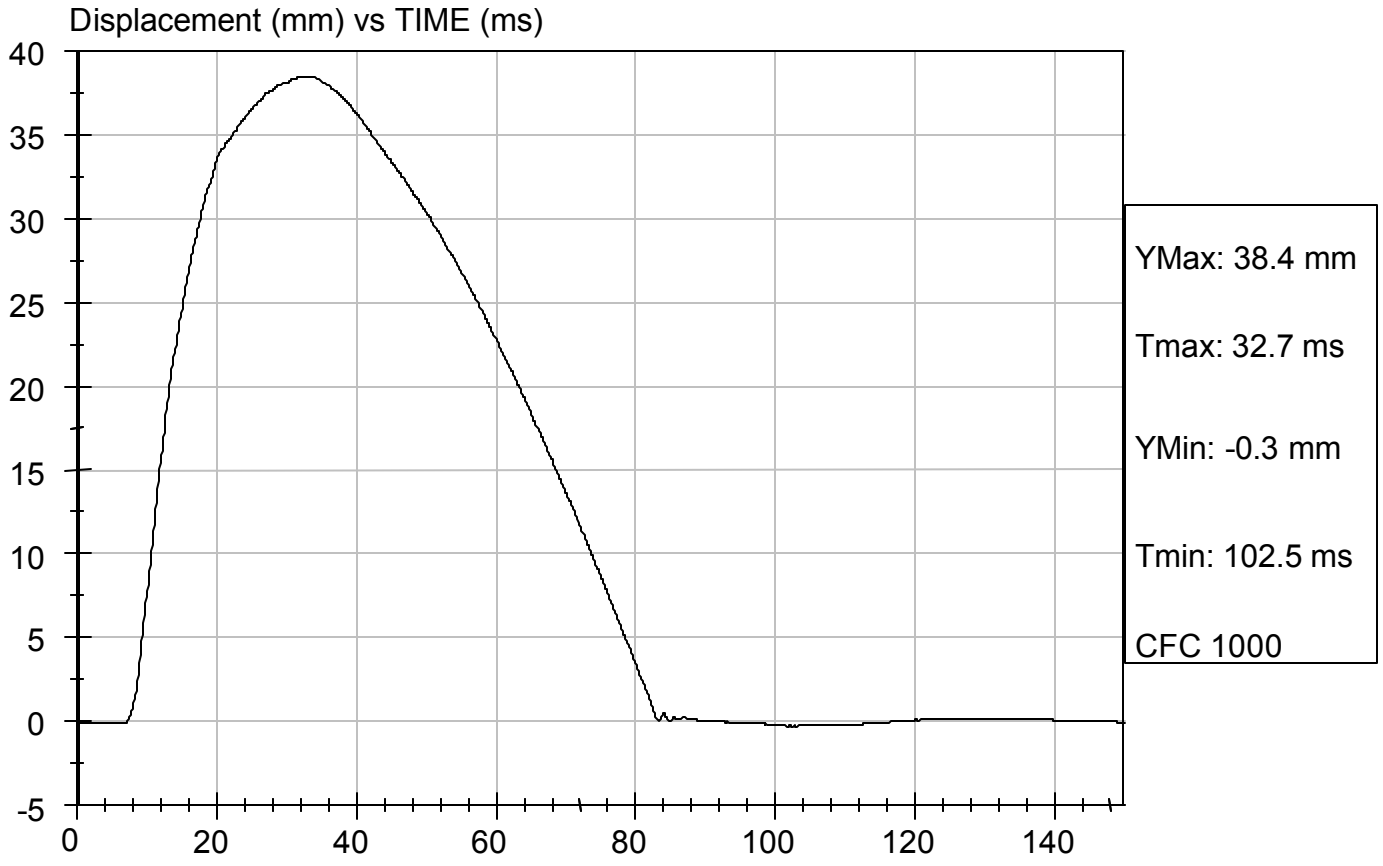




Test Desc: Dampener Impact
Component ID: D09568

Test Date: 3/18/09
Speed: 20 ft/sec, 6.10 m/sec





Calibration Test Results Summary

Dummy Serial Number: 037

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 037 **Test I.D:** D09642

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	42	Pass
Lower Rib	G's	37 - 46	39	Pass
Lower Spine	G's	15 - 22	21	Pass
		Overall Test Results		Pass

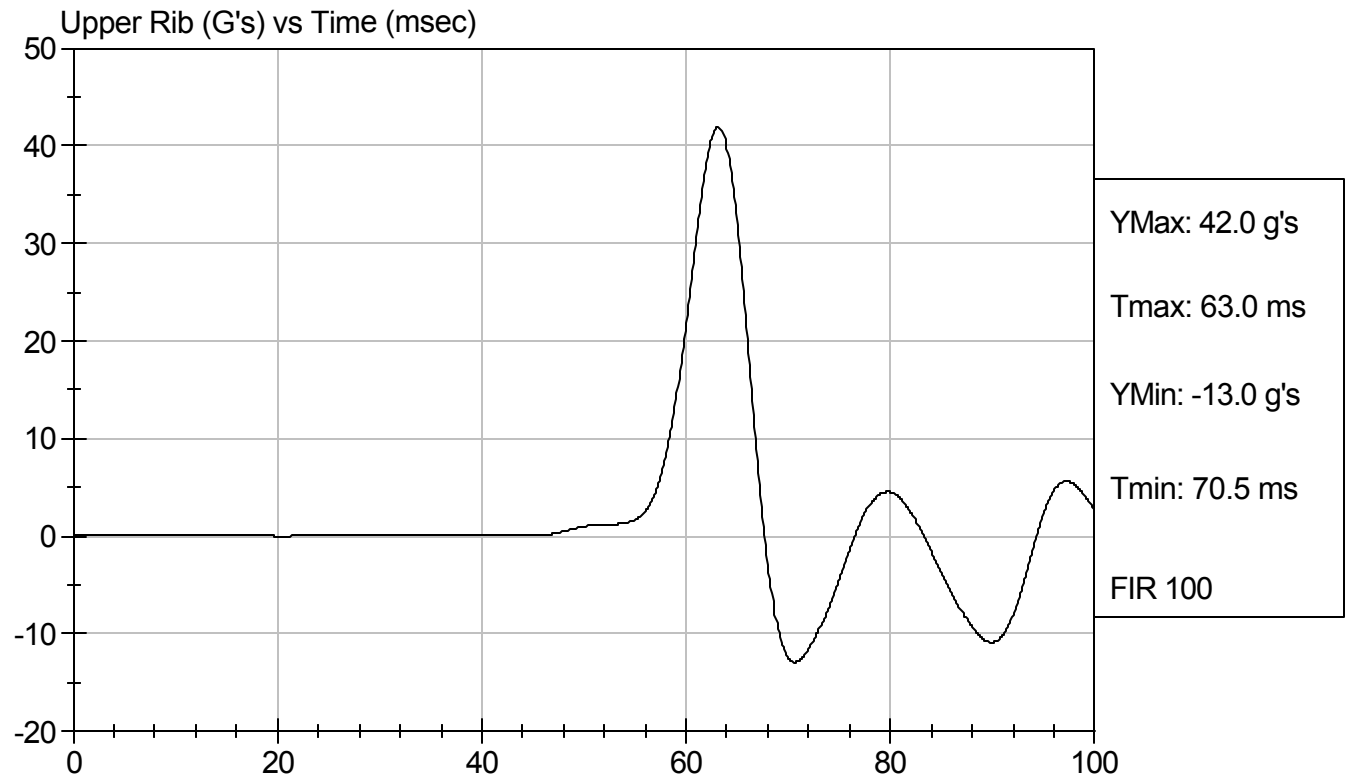
Jessica Hall
Laboratory Technician

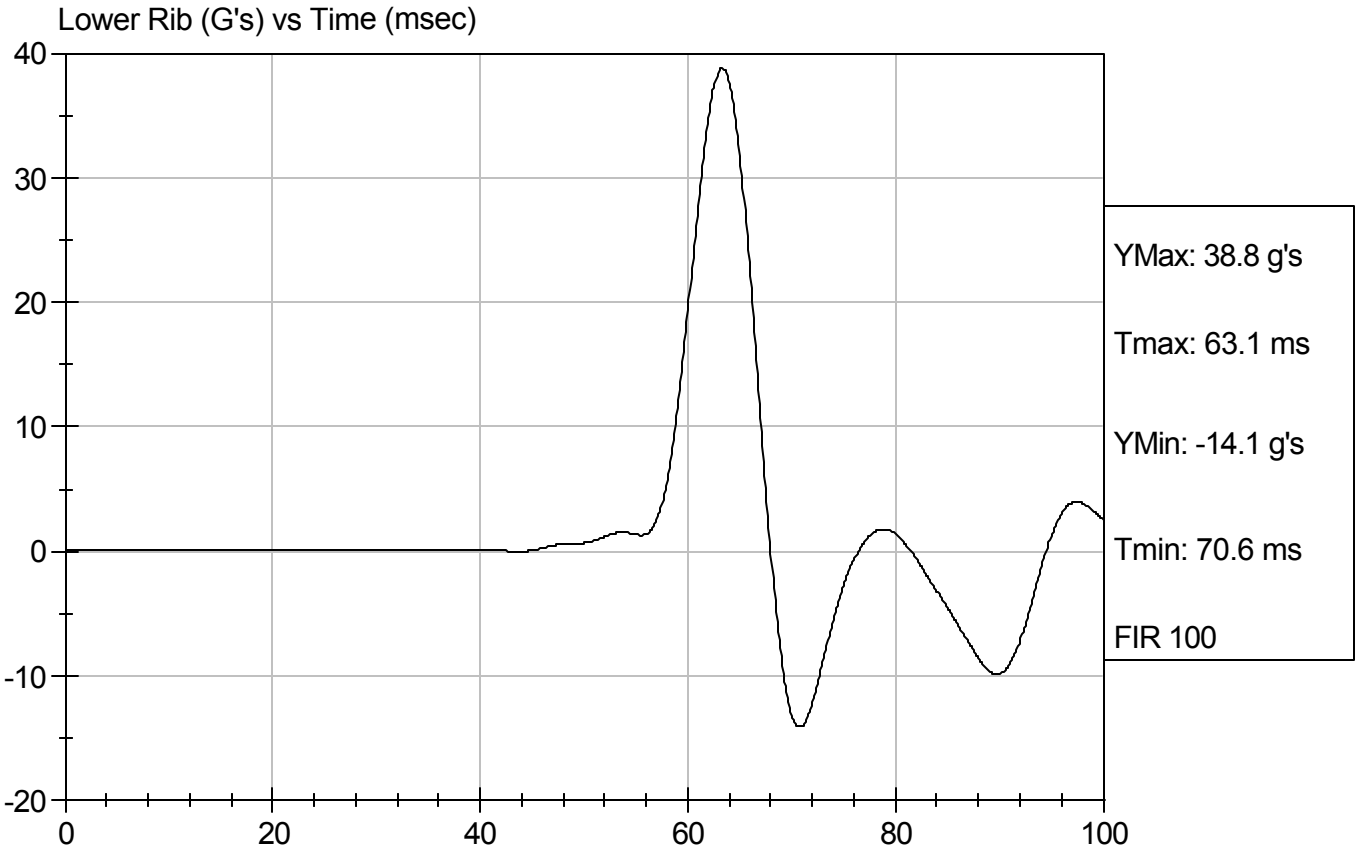
3/24/09
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D09642

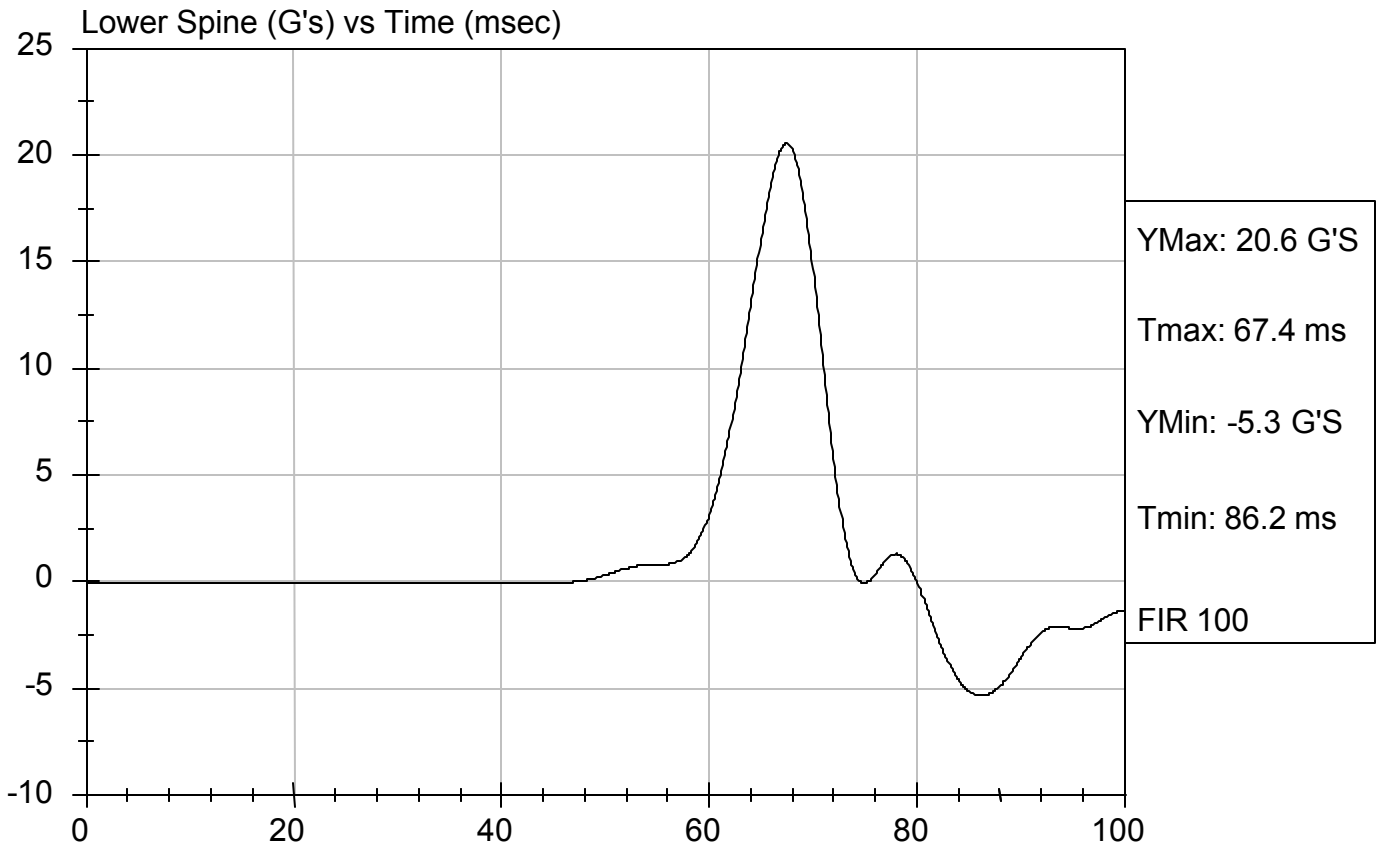
Test Date: 3/24/09
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D09642

Test Date: 3/24/09
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 037 **Test I.D:** D09643

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
		Overall Test Results		Pass

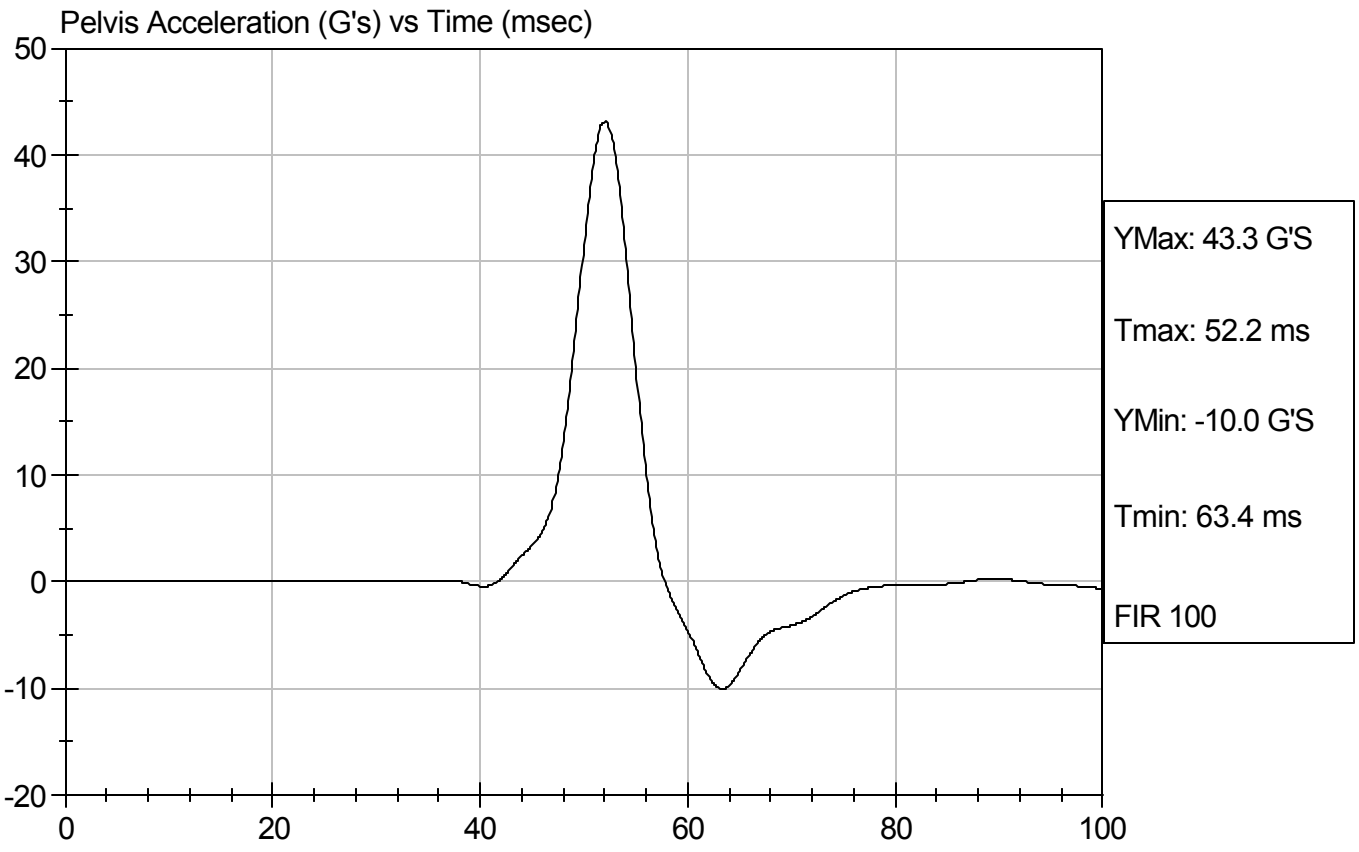
Jessica Hall
Laboratory Technician

3/24/09
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D09643

Test Date: 3/24/09
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 037 **Test I.D:** D09644

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Force At 12.7 mm	N	104 -162	133	Pass
Force At 19 mm	N	163 - 222	185	Pass
Force At 25.4 mm	N	222 - 280	250	Pass
Force At 33 mm	N	325 - 391	342	Pass
		Overall Test Results		Pass

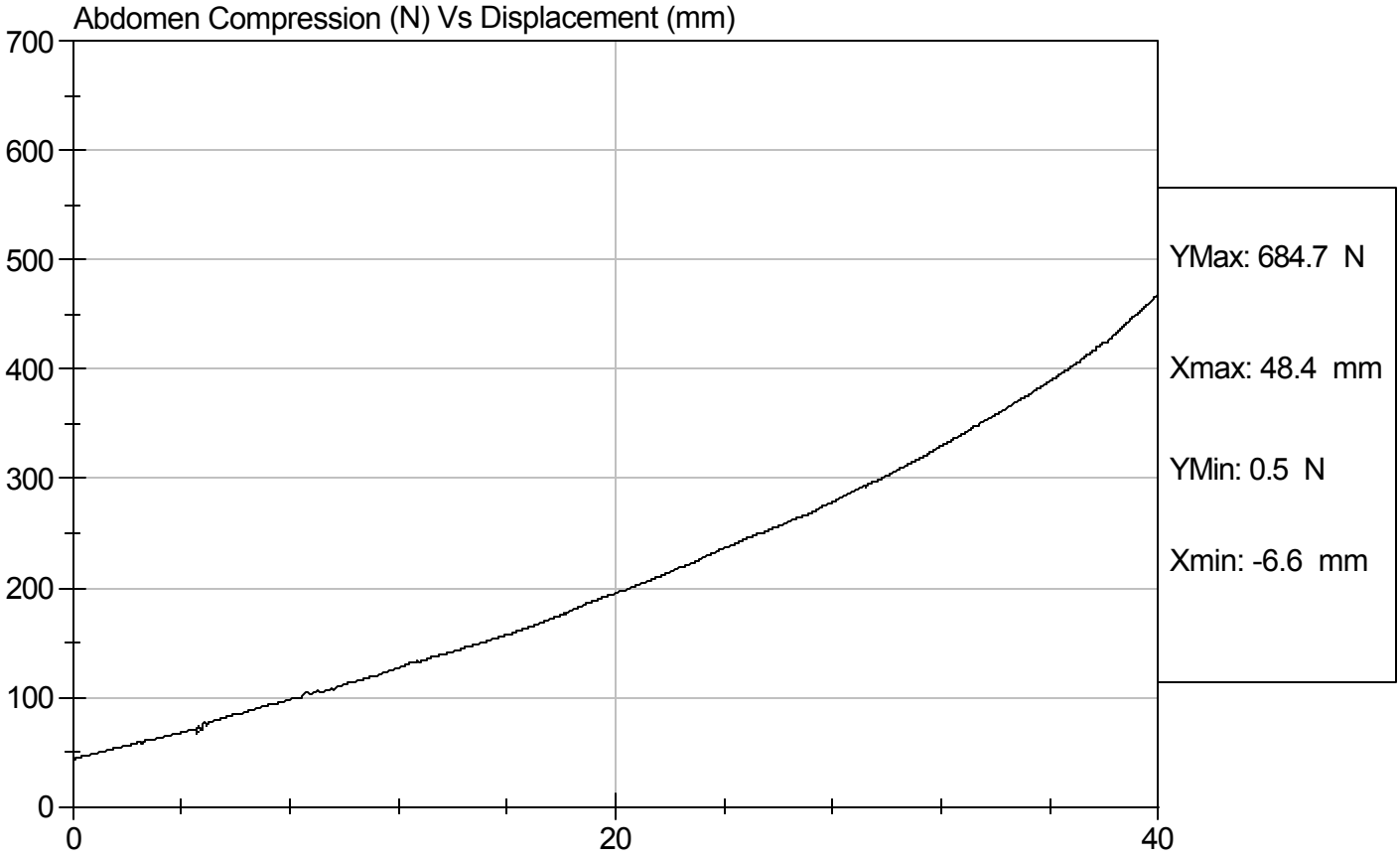
Jessica Gall
Laboratory Technician

3/24/09
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression Test Date: 3/24/09

Component: D09644 Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 037 **Test I.D:** D09645

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	114.3	Pass
Force At 30 deg	N	151.2 - 204.6	163.8	Pass
Force At 40 deg	N	204.6 - 258.0	224.5	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

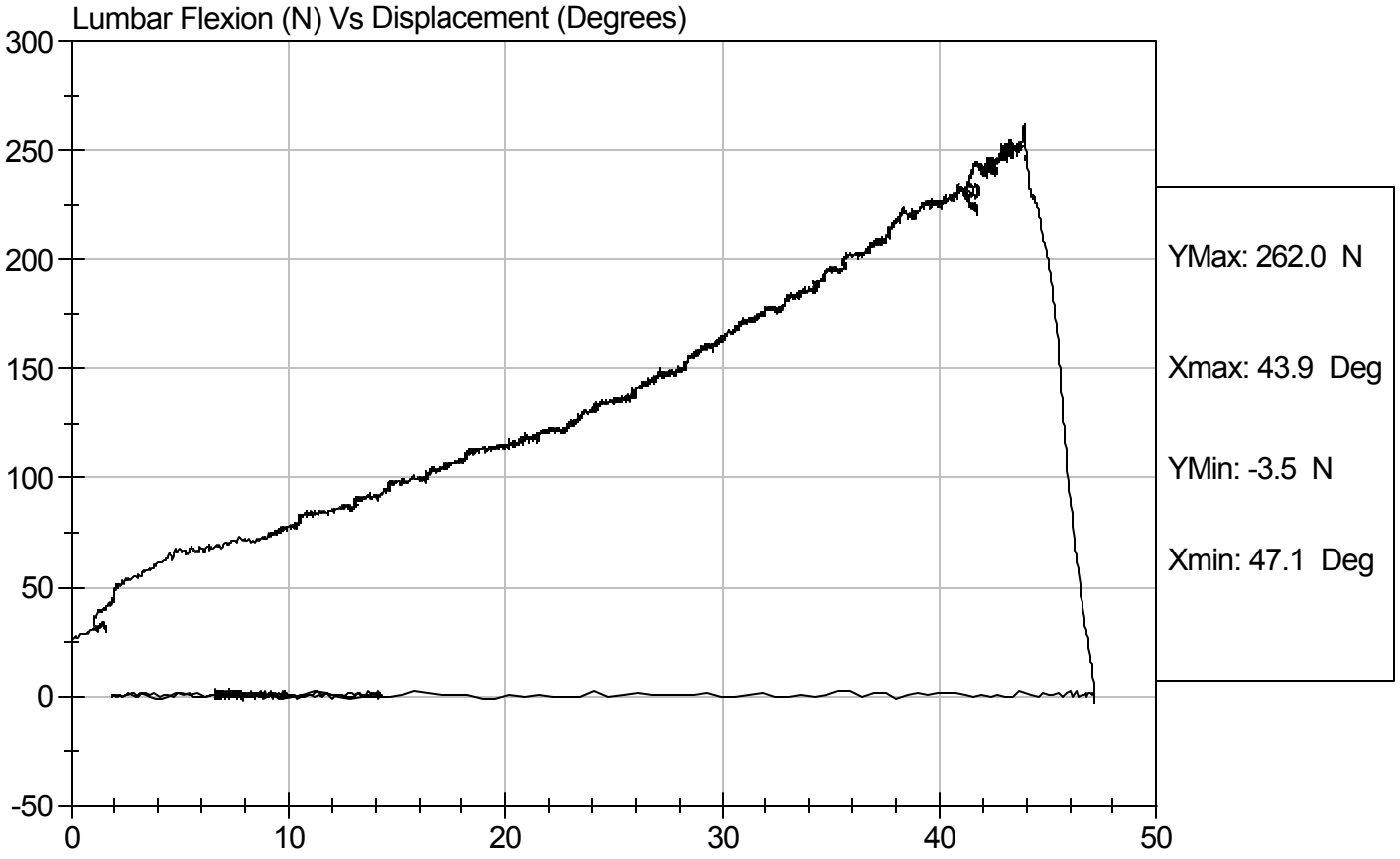
Jessica Hall
Laboratory Technician

3/24/09
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 3/24/09

Component: D09645 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 037

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass

Jessica Hall
Laboratory Technician

03/25/2009
Test Date

David Winkelbauer
Approved By

APPENDIX D

CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER DUMMY NO. 036		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	P47096	Endevco	2/11/2009
Lower Rib Y	P52171	Endevco	2/11/2009
Lower Spine Y	P59301	Endevco	2/11/2009
Pelvis Y	P47093	Endevco	2/11/2009
Upper Rib Redundant Y	P47106	Endevco	2/11/2009
Lower Rib Redundant Y	P52170	Endevco	2/11/2009
Lower Spine Redundant Y	P59303	Endevco	2/11/2009
Pelvis Redundant Y	P47094	Endevco	2/11/2009

	INSTRUMENTS FOR PASSENGER DUMMY NO. 037		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	P63210	Endevco	2/10/2009
Lower Rib Y	P63206	Endevco	2/10/2009
Lower Spine Y	P52257	Endevco	12/05/2008
Pelvis Y	P59283	Endevco	12/05/2008
Upper Rib Redundant Y	P63213	Endevco	2/10/2009
Lower Rib Redundant Y	P63215	Endevco	2/10/2009
Lower Spine Redundant Y	P52282	Endevco	12/05/2008
Pelvis Redundant Y	P59321	Endevco	12/05/2008

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Right Front Sill X	G29-X14	Entran	3/12/2009
Right Front Sill Y	G29-X39	Entran	3/12/2009
Right Front Sill Z	G16-Z11	Entran	3/12/2009
Right Rear Sill X	J23-M09	Entran	11/13/2008
Right Rear Sill Y	J26-H11	Entran	11/13/2008
Right Rear Sill Z	J23-M13	Entran	11/13/2008
Floorpan @ Rear Axle X	G29-X26	Entran	3/12/2009
Floorpan @ Rear Axle Y	F28-N05	Entran	1/13/2009
Floorpan @ Rear Axle Z	L02-Z21	Entran	3/18/2009
Left Rear Sill Y	P27029	Endevco	11/13/2008
Left Front Sill Y	ANAT6	Endevco	12/13/2008
RR Occupant Compartment Y	A07-R11	Entran	2/16/2009
Left Lower B-Post Y	A008123	MSI	11/13/2008
Left Mid B-Post Y	J23808	Endevco	3/12/2009
Left Lower A-Post Y	P27024	Endevco	11/13/2008
Left Mid A-Post Y	J23-J08	Entran	11/12/2008
Driver Seat Track Y	J23-J06	Entran	1/13/2009
Vehicle CG X	J07-H23	Entran	11/12/2008
Vehicle CG Y	B10-Z24	Entran	12/13/2008
Vehicle CG Z	A27-Z25	Entran	12/13/2008
MDB CG X	L02-Z22	Entran	11/13/2008
MDB CG Y	L02-Z25	Entran	11/13/2008
MDB CG Z	L02-Z05	Entran	11/13/2008
MDB Rear X	D12-X13	Entran	12/13/2008
MDB Rear Y	D12-X16	Entran	12/13/2008